



Pattern of Housing Characteristics in India and its States : An Analysis

N Chendrayudu^{1*}, T Chandrasekarayya²

¹ Faculty, Dept. of Geography, S.V. University, Tirupati, 517502

² Faculty, Dept. of Population Studies, S.V. University, Tirupati, 517502

 OPEN ACCESS

Received: 17.06.2023

Accepted: 22.10.2023

Published: 11.11.2023

Citation: Chendrayudu N, Chandrasekarayya T. (2023). Pattern of Housing Characteristics in India and its States : An Analysis. *Geo-Eye*. 12(2): 34-43. <https://doi.org/10.53989/bu.ge.v12i2.5>

* **Corresponding author.**
ncrgeo64@gmail.com

Funding: None

Competing Interests: None

Copyright: © 2023 Chendrayudu & Chandrasekarayya. This is an open access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Published By Bangalore University, Bengaluru, Karnataka

ISSN

Print: 2347-4246

Electronic: XXXX-XXXX

Abstract

Housing plays a crucial role in the lives of individuals within any society. House ownership has traditionally been highly valued, seen as essential for family stability and wealth creation. The quality of housing, including access to basic amenities like water, sanitation, electricity, and more, is a significant indicator of a country's socio-economic development. Housing with basic necessities is a fundamental factor in economic, social, and civic progress, with various housing-related activities directly contributing to broader development objectives. When individuals and families do not have adequate housing with better characteristics, their well-being is severely affected. Inadequate housing can lead to poor health outcomes, placing a strain on the healthcare system. This study utilizes a descriptive research design, analyzing secondary data from the National Family Health Surveys (N.F.H.S) 1 to 5, to explore housing characteristics patterns in India and its states.

Keywords: Electricity; Drinking Water; Toilet; Fuel for Cooking; Pucca House and Persons Per Room

Introduction

India is home to a staggering 300 million individuals who endure extreme poverty and grapple with the lack of basic necessities such as food, clothing, and shelter. These individuals face the harsh reality of living in homes that lack essential services like water, sanitation, electricity, healthcare, and education (**Millennium Development Report, 2014**). The provision of basic amenities in housing is crucial not only for improving the socio-economic status and standard of living of households, but also for fostering sustainable development. The absence of basic amenities within households, highlights the exclusion of a sig-

nificant portion of the population from essential social infrastructures. In light of this, Rabiul Ansary and Bhaswati Das⁽¹⁾ argue that the denial of basic amenities like clean fuel and electricity will hinder India's efforts in controlling pollution and addressing issues such as climate change. The National Family Health Survey (N.F.H.S) offers insights into the demographic and socio-economic characteristics of households, shedding light on key housing aspects of the population. Understanding household characteristics and housing conditions provides valuable context for comprehending the socio-economic, demographic, and health situation of the population.

The study of housing and its characteristics serves as a reliable means of expressing human responses to the physical and cultural environment of a region. It represents the cultural achievements of the past and the preservation of traditions through simple architectural features. The housing conditions of families directly reflect their socio-economic and cultural status.

In typical human settlement patterns, there is a noticeable disparity in the types of houses occupied by different families. Affluent upper caste families reside in elaborate houses equipped with excellent all facilities, showcasing their social, cultural, and economic status. On the other hand, lower caste families find shelter in small houses or huts with inadequate basic facilities. Housing Characteristics like drinking water, bathroom and toilet facilities are essential to maintain one's good health and productivity. It is often argued that good housing conditions are essential elements for enhancing household health, and that poor housing and environmental conditions can lead to many health problems, including infectious diseases (such as tuberculosis and malaria), stress and depression (Udofia, Yawson, Aduful, & Bwambale, 2014). Zihan Kan et al.⁽²⁾ study results indicate that communities with relatively poor housing conditions have impact of housing on mental health may be more direct; while, for communities with relatively good housing conditions, the effect of housing characteristics on mental health may be indirect. The quality of life of any households in a region (state) is largely determined by availability of safe drinking water, sanitation, drainage facility for waste water, type of fuel used for cooking purposes and availability of separate kitchen, congestion of the households⁽³⁾. Availability of basic amenities within households is also another proxy indicator to study multi-dimensional deprivations and social inclusion or exclusion of a population. In many villages of India, the practice of untouchability still forces people belonging to a particular caste to fetch water from long distances⁽⁴⁾.

Review

Bhagat et al. (2018)⁽⁴⁾ conducted a study that focused on housing characteristics in nine villages located in the Melghat areas of Maharashtra and these areas are known for their high levels of poverty and malnutrition. In a study by Ibrahim Yakubu et al.⁽⁵⁾, the link between housing conditions, resident health, and poverty levels was explored in the Metropolitan area. The findings revealed that a majority of houses in this area lack essential in-house facilities. Wei Guo⁽⁶⁾ found that housing type and size have a significant impact on the health of migrants, while housing instability has a greater effect on the health of urban locals. Maria Löfstedt⁽⁷⁾ conducted a new case study that reviewed the relationship between physical housing characteristics, housing accessibility, and various aspects of health among older people living in the community. Coley et al.⁽⁸⁾ conducted research that demonstrated how

poor housing conditions negatively affect the development of children and adolescents. Dekker et al.⁽⁹⁾ concluded that individual characteristics such as age, presence of children, and length of stay are more influential in explaining residential satisfaction than specific estate characteristics. In a study by Daan Schipper⁽¹⁰⁾, it was found that various socio-demographic variables have a significant impact on subjective well-being in relation to housing characteristics, as well as certain economic activities. Esraa A. Attia⁽¹¹⁾ aimed to reveal the relationship between rural housing characteristics and social-economic variables for the heads of families residing in these areas. Rabiul Ansary and Bhaswati Das⁽¹⁾ concluded that households lacking good housing conditions and basic amenities, which are essential for healthy and productive manpower, tend to have lower assets.

Objective

The paper aims at examine the pattern of housing characteristics in India and its 30 states based on secondary data during the period of 1992-93 of N.F.H.S-1 to 2019-21 of N.F.H.S-5.

Methodology

The research paper utilizes a descriptive research design and relies on secondary data obtained from the National Family Health Survey (N.F.H.S) conducted over a span of 38 years, from 1 to 5. The housing characteristics examined include electricity, drinking water, toilet/latrline facility, solid fuel used for cooking, pucca house, and the mean number of persons per room used for sleep. The N.F.H.S-1, conducted in 1992-93, encompassed 88,562 households. In 1998-99, the NFHS-2 survey included a representative sample of 91,196 households. NFHS-3 collected information from a nationally representative sample of 109,041 households in 2005-06, while N.F.H.S-4 in 2015-16 selected 628,900 households. Lastly, the NFHS-5 survey of 2019-21 covered a total of 636,699 sample households.

Results and Discussion

Housing characteristics data can be used as an indicator to address statistically how many people from various states have been excluded from an adequate standard/quality of living. The pattern of households' dwelling characteristics has been captured by seeing the condition of residential houses, types of house structures, the number of rooms a household possesses and other basic amenities such as electricity, drinking water, toilet/latrline facility, and percent of solid fuel used for cooking and these basic household amenities are discussed briefly hereunder.



Electricity

Electricity plays a crucial role in the daily lives of humans and is a significant factor in the modern economy. It is utilized for various purposes such as lighting, heating, cooling, refrigeration, operating appliances, computers/electronics, machinery, and transportation systems. Yunqing Lu et al. (12) conducted a study on energy consumption and household characteristics by implementing a dynamic pricing experiment in communal housing within a smart community in Japan. Table 1 illustrates the distribution of households with electricity in India and its states.

Table 1 reveals those substantial variations in households with access to electricity during the period of N.F.H.S-1 to N.F.H.S-3. However, access to electricity drastically improved in India and its states in the period of N.F.H.S-4 and N.F.H.S-5. In most states, over 95 percent of sampled households have electricity and almost all households in India (97%) have electricity in N.F.H.S- 5 of 2019-20. It clearly indicates that sampled households had electricity for many purposes in their homes to lead better life.

Drinking water

The provision and availability of safe drinking water and sanitation plays a crucial role in enhancing the quality of life and promoting good health. It helps in reducing illnesses, water-borne diseases, and fatalities, leading to lower health expenses, increased savings, and enhanced human efficiency. In rural areas, women or girls are typically tasked with fetching water from various sources for household purposes. The accessibility of water was a key aspect of the Minimum Need Programme initiated between 1974 and 1979 to cater to all segments of society. Ensuring access to clean and safe drinking water is essential for overall health and well-being. In certain states like Manipur, Odisha, Meghalaya, Tripura, Jharkhand, and Madhya Pradesh, around 33 percent of households, and in states like Nagaland, West Bengal, Chhattisgarh, and Rajasthan, approximately 25 percent of households, obtain water from sources located away from their homes (3). Drinking water serves various vital functions in the body, such as regulating body temperature, maintaining healthy skin, and aiding in digestion (Duselis, Amanda R et al., 2007 and Amend, Sarah R et al., 2016). The National Family Health Survey (N.F.H.S) recognizes improved sources of drinking water, "including piped water, public taps, standpipes, tube wells, boreholes, protected dug wells and springs, rainwater, and community reverse osmosis (RO) plants". These sources help safeguard against external contamination, ensuring that the water is safe for consumption.

Table 2 reveals that significant percent of households had increase access to improved source of drinking water in India and its states during the study period. In N.F.H.S-1, only

over 40.0 percent access to improved source of drinking water in states like Assam, Manipur, Meghalaya, Mizoram, Tripura and Kerala being with least 21.0 percent) wherein most of the households get drinking water from open well with the premises of house in general., over 80.0 percent and 90.0 percent of household have access in most of the states and in India in N.F.H.S-3 and N.F.H.S-4 respectively. However, in most of the states and in India, over 95.0 percent of households have access to improved source of drinking water in N.F.H.S-5. This clearly indicates that most of people are protected from water born diseases with having access to improved source of drinking water.

Toilet facilities

According to the World Health Organization, open defecation is considered the most dangerous sanitation practice. Nearly 10 percent of all communicable diseases are associated with unsafe water and inadequate sanitation. In 1986, the Government of India initiated the Central Rural Sanitation Programme (CRSP) to enhance sanitation coverage in rural areas, aiming to improve the health and quality of life of rural residents, especially women, by providing privacy and dignity. The Total Sanitation Campaign (TSC), a variant of CRSP, was introduced in 1999 with a community-driven and people-centric approach. Despite efforts to achieve the MDG Goal of 'Sanitation for All' by 2012, the TSC programs fell short. The 2011 Census revealed that almost half of Indian households (49.8 percent) practices open defecation, with 53 percent lacking toilet facilities in their premises. A study by (3) based on the 2011 Census indicated that central Indian states have higher rates of open defecation compared to the rest of the country. While a significant portion of the population lacks household toilets, a majority own mobile phones. Cultural norms, traditional beliefs, lack of awareness, and low education levels are cited as the main reasons for this unhygienic practice (1). The National Family Health Survey (N.F.H.S) defines toilet facilities as "any non-shared toilet types, including flush/pour flush toilets connected to piped sewer systems, septic tanks, and pit latrines; ventilated improved pit (VIP)/biogas latrines; pit latrines with slabs; and twin pit/composting toilets".

Table 3 depicts drastic improvement in households with any toilet facility in India and its states during of N.F.H.S-1 of 1992-93 and N.F.H.S-5 of 2019-20. In N.F.H.S-1, less than 25.0 percent of household have access to toilet in states like Himachal Pradesh, Jammu & Kashmir, Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Odisha and Andhra Pradesh. About 30.0 percent households have no toilet facility in state like Himachal Pradesh, Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Odisha and Andhra Pradesh in N.F.H.S-2, while significant percent of households had access to toilet facility in majority of the states and in India during the period of N.F.H.S-3 and N.F.H.S-4. However, less than 25.0



Table 1. Percent of households with electricity in India and its states

S. No	India/ State	NFHS-1	NFHS-2 (1998-	NFHS-3(2005-	NFHS-4 (2015-	NFHS-5 (2019-
		(1992‑93)	99)	06)	16)	21)
		Total	Total	Total	Total	Total
1.	Delhi	95.5	97.7	99.3	98.8	99.9
2.	Haryana	85.0	89.1	91.5	98.8	99.5
3.	Himachal Pradesh	90.2	97.2	98.4	99.5	99.4
4.	Jammu & Kashmir	86.7	90.1	93.2	97.4	99.3
5.	Punjab	92.0	95.5	96.3	99.6	99.6
6.	Rajasthan	51.9	64.4	66.1	91.0	97.9
7.	Uttarakhand	-	-	80.0	92.5	99.4
8.	Chhattisgarh	-	-	71.4	95.6	98.5
9.	Madhya Pradesh	62.4	68.1	71.4	89.9	98.1
10.	Uttar Pradesh	31.9	36.6	42.8	70.9	89.8
11.	Bihar	16.6	18.2	27.7	58.6	95.6
12.	Jharkhand	-	-	40.2	95.6	98.5
13.	Odisha	27.8	33.8	45.4	85.5	96.3
14.	West Bengal	32.9	36.7	52.5	93.7	97.0
15.	Arunachal Pradesh	63.1	68.9	76.9	88.7	94.7
16.	Assam	20.4	26.4	38.1	78.2	92.7
17.	Manipur	62.1	75.3	67.0	92.4	97.8
18.	Meghalaya	42.6	41.2	70.4	91.4	92.0
19.	Mizoram	76.0	64.1	92.3	95.9	98.0
20.	Nagaland	76.9	56.3	82.9	96.9	98.6
21.	Sikkim	-	80.7	92.1	99.4	99.3
22.	Tripura	45.1	-	68.8	92.7	97.9
23.	Goa	91.7	93.5	96.4	99.8	100.0
24.	Gujarat	76.6	84.3	89.3	96.0	97.2
25.	Maharashtra	73.6	82.1	83.5	92.5	97.4
26.	Andhra Pradesh	62.2	74.4	88.4	98.8	99.1
27.	Karnataka	64.0	80.9	89.3	97.8	98.8
28.	Kerala	60.3	71.8	91.0	99.2	99.5
29.	Tamil Nadu	63.8	78.8	88.6	98.8	99.0
30.	Telangana	-	-	-	98.3	99.3
India		50.9	60.1	67.9	88.2	96.5

Source: International Institute for Population Sciences (IIPS) and Government of India; Ministry of Health and Family Welfare, New Delhi, National Family Health Survey-1 to 5.

percent of household had not having toilet facility in states like Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Odisha, Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu in the period of N.F.H.S-5, it causes to practice open defecation. No access to sanitary toilet provisions led to no ensure of hygiene conditions. It reveals the extreme conditions that exist in these states there by riskiest sanitation practice may causes to water and air born diseases that leads ill health of people.

Use of solid fuel for cooking

Exposure to indoor smoke, whether from cooking with solid fuels or smoking tobacco, can have adverse health effects. The risk of exposure to cooking smoke is higher when cooking is done indoors rather than in a separate structure or outdoors. India faces a significant challenge in providing safer cooking fuel options. The United Nations' efforts to combat extreme poverty may not reach their full potential unless countries prioritize bringing electricity and modern, safe cooking technologies to the billions of energy-poor individuals worldwide⁽¹³⁾. Majority (71.5 percent) of



Table 2. Percent of households with improved source of drinking water in India and its states

S. No	India/ State	NFHS-1	NFHS-2	NFHS-3	NFHS-4	NFHS-5
		(1992-93)	(1998-99)	(2005-06)	(2015-16)	(2019-21)
		Total	Total	Total	Total	Total
1.	Delhi	99.5	98.7	92.1	80.0	99.5
2.	Haryana	73.0	88.0	95.6	91.6	98.6
3.	Himachal Pradesh	57.6	77.4	88.4	94.6	96.4
4.	Jammu & Kashmir	57.3	70.6	80.8	89.2	92.3
5.	Punjab	98.6	98.9	99.5	99.1	98.8
6.	Rajasthan	57.3	69.8	81.8	85.5	96.4
7.	Uttarakhand	-	-	87.4	92.9	95.5
8.	Chhattisgarh	-	-	77.9	91.1	95.6
9.	Madhya Pradesh	55.8	63.5	74.2	84.7	88.9
10.	Uttar Pradesh	74.3	85.6	93.7	96.4	99.2
11.	Bihar	63.6	75.4	96.1	98.2	99.1
12.	Jharkhand	-	-	57.0	77.7	86.8
13.	Odisha	50.9	65.3	78.4	88.8	90.8
14.	West Bengal	84.9	89.3	93.7	94.6	97.5
15.	Arunachal Pradesh	75.8	80.7	85.0	87.5	94.2
16.	Assam	43.2	60.1	72.4	83.8	86.4
17.	Manipur	47.0	48.9	52.1	41.6	77.0
18.	Meghalaya	47.6	42.1	63.1	67.9	79.2
19.	Mizoram	40.1	63.2	85.0	91.4	95.7
20.	Nagaland	72.1	40.5	62.8	80.6	91.0
21.	Sikkim	-	84.6	77.6	97.6	94.0
22.	Tripura	44.1	-	76.1	87.3	88.5
23.	Goa	56.5	61.8	80.1	96.3	98.2
24.	Gujarat	75.1	84.5	89.8	90.9	97.5
25.	Maharashtra	78.5	81.9	92.7	91.5	93.8
26.	Andhra Pradesh	63.4	78.5	94.0	72.7	96.7
27.	Karnataka	75.6	87.0	86.2	89.3	95.6
28.	Kerala	21.0	19.9	69.1	94.3	94.9
29.	Tamil Nadu	74.6	85.0	93.5	90.6	98.6
30.	Telangana	-	-	-	77.9	98.7
India		68.2	77.9	87.9	89.9	95.9

Source: International Institute for Population Sciences (IIPS) and Government of India; Ministry of Health and Family Welfare, New Delhi, National Family Health Survey-1 to 5.

Table 3. Percent of households with toilet facility in India and its states

S. No	India/ State	NFHS-1	NFHS-2 (1998-	NFHS-3 (2005-	NFHS-4 (2015-	NFHS-5 (2019-
		(1992‑93)	99)	06)	16)	21)
		Total	Total	Total	Total	Total
1.	Delhi	84.1	94.4	92.4	96.0	98.7
2.	Haryana	26.9	39.0	52.4	89.8	96.6
3.	Himachal Pradesh	12.6	26.7	46.4	85.7	93.5
4.	Jammu & Kashmir	19.1	51.0	61.7	79.3	94.3
5.	Punjab	36.7	51.4	70.8	92.9	97.2
6.	Rajasthan	19.8	27.8	30.8	54.0	77.5
7.	Uttarakhand	-	-	56.8	82.9	93.6
8.	Chhattisgarh	-	-	18.7	41.3	84.7
9.	Madhya Pradesh	21.3	22.2	27.0	42.8	73.8
10.	Uttar Pradesh	22.9	26.5	33.1	45.8	77.1
11.	Bihar	16.5	16.8	25.2	33.5	61.6
12.	Jharkhand	-	-	22.6	30.0	66.4
13.	Odisha	12.2	13.5	19.3	35.0	66.1
14.	West Bengal	40.4	44.8	59.6	74.9	88.0
15.	Arunachal Pradesh	73.6	73.0	80.6	90.8	98.5
16.	Assam	49.6	63.0	76.4	88.9	95.8
17.	Manipur	83.1	92.0	95.6	98.7	99.5
18.	Meghalaya	54.3	52.0	71.3	92.4	95.8
19.	Mizoram	98.3	97.7	98.0	99.1	99.9
20.	Nagaland	79.3	74.3	85.6	98.3	99.6
21.	Sikkim	-	72.7	89.0	99.7	99.6
22.	Tripura	79.4	-	96.7	97.9	98.9
23.	Goa	48.0	58.9	76.0	89.1	96.3
24.	Gujarat	35.0	44.9	54.6	71.0	80.7
25.	Maharashtra	40.8	45.9	52.9	71.2	82.7
26.	Andhra Pradesh	24.4	27.3	42.4	61.3	83.7
27.	Karnataka	31.2	38.6	46.5	65.8	82.3
28.	Kerala	70.9	85.2	96.1	99.2	99.7
29.	Tamil Nadu	29.4	34.0	42.9	61.7	77.5
30.	Telangana	-	-	-	69.0	87.3
India		30.3	35.9	44.6	61.1	80.6

Source: International Institute for Population Sciences (IIPS) and Government of India; Ministry of Health And Family Welfare, New Delhi, National Family Health Survey-1 to 5.

households in India still rely on firewood, crop residue, cow dung cakes, or coal for cooking, which are common traditional fuels in rural areas⁽¹⁾. It is estimated that up to 70 percent of households in developing nations use wood, dung, and crop residues for cooking (International Energy Agency, 2002). The National Family Health Survey considers solid fuels for cooking to include “coal/lignite, charcoal, wood, straw/shrubs/grass, agricultural crop waste, and dung cakes”.

Table 4 reveals the substantial variations across in India and states in households with used solid fuel for cooking. Significant percent of households had used solid fuel for

cooking during the period of N.F.H.S-1 and N.F.H.S-4 in India and many states. Even in N.F.H.S-5 period also, over 50.0 percent of households used solid fuel for cooking in India and its many states. Hence, burn of solid fuel for cooking causes to harmful air pollution that leads health impact on lungs related diseases especially among women and children.

Type of House

Houses owned by the wealthy are considered 'pucca', indicating that they are constructed using durable materials such as stone, brick, and cement. On the other hand, the houses



Table 4. Percent of households with solid fuel for cooking in India and its states

S. No	India/ State	NFHS-1	NFHS-2 (1998-	NFHS-3 (2005-	NFHS-4 (2015-	NFHS-5 (2019-
		(1992‑93)	99)	06)	16)	21)
		Total	Total	Total	Total	Total
1.	Delhi	4.4	3.6	9.3	3.6	0.8
2.	Haryana	55.6	66.9	69.1	47.4	40.1
3.	Himachal Pradesh	84.8	64.0	68.9	62.5	47.7
4.	Jammu & Kashmir	64.9	65.8	59.5	41.5	30.2
5.	Punjab	44.9	60.6	54.9	33.5	22.1
6.	Rajasthan	81.0	81.0	77.2	67.8	58.5
7.	Uttarakhand	-	-	61.7	48.1	40.5
8.	Chhattisgarh	-	-	86.7	76.7	66.4
9.	Madhya Pradesh	68.2	79.3	80.3	69.7	59.3
10.	Uttar Pradesh	68.3	82.8	81.7	66.7	50.3
11.	Bihar	51.1	85.9	89.7	81.9	62.0
12.	Jharkhand	-	-	89.1	80.6	67.8
13.	Odisha	68.7	86.8	88.6	79.6	64.9
14.	West Bengal	31.6	65.7	79.2	69.6	59.1
15.	Arunachal Pradesh	87.7	80.8	67.7	54.2	46.6
16.	Assam	87.8	87.1	75.8	74.2	56.4
17.	Manipur	80.5	69.2	64.7	57.6	29.6
18.	Meghalaya	82.0	83.5	72.2	74.7	63.4
19.	Mizoram	66.2	57.4	34.1	31.2	16.0
20.	Nagaland	97.4	86.1	76.0	66.6	56.5
21.	Sikkim	-	63.2	52.4	39.1	20.7
22.	Tripura	91.1	-	80.4	62.1	53.0
23.	Goa	51.3	41.4	33.3	13.7	2.8
24.	Gujarat	55.9	54.5	52.3	44.2	32.2
25.	Maharashtra	55.2	51.9	48.1	36.0	18.2
26.	Andhra Pradesh	77.0	74.1	66.3	37.1	15.6
27.	Karnataka	75.4	67.8	63.8	43.4	19.4
28.	Kerala	87.4	81.7	71.4	42.3	27.4
29.	Tamil Nadu	77.7	66.5	60.5	24.3	15.4
30.	Telangana	-	-	-	30.8	7.7
	India	63.9	71.7	70.8	54.7	40.6

Source: International Institute for Population Sciences (IIPS) and Government of India; Ministry of Health And Family Welfare, New Delhi, National Family Health Survey-1to5.

of the poor are categorized as 'Semi katcha' or 'katcha', as they are built using less durable materials like country tiles, stone rubbles, mud, and thatch, which are readily available locally. In rural areas of India, the design of houses is influenced by the availability of local building materials. The construction of houses in rural settings aims to fulfill the functional needs of the families residing in them. Approximately 12 percent of residential structures in India are temporary in nature. The eastern and central regions (West Bengal, Odisha, Bihar, Jharkhand, and Chhattisgarh) have a higher percentage of dilapidated houses used for residential purposes, while the

southern and western states report the lowest percentage⁽¹⁾. According to the National Family Health Survey (N.F.H.S), "pucca houses are those constructed using high-quality materials for the floor, roof, and exterior walls".

Table 5 reveals the substantial variations in households living in a pucca house in India and its states during the period of N.F.H.S-1 to N.F.H.S-5 and majority of households were not lived in pucca houses in many states. However, an improvement was observed in percent of households living in a pucca house in India and its states during the period of N.F.H.S-1 to N.F.H.S-5 due to construction of pucca for socio-

Table 5. Percent of households living in a pucca house in India and its states

S. No	India/ State	NFHS-1	NFHS-2 (1998-	NFHS-3 (2005-	NFHS-4 (2015-	NFHS-5 (2019-
		(1992‑93)	99)	06)	16)	21)
		Total	Total	Total	Total	Total
1.	Delhi	81.0	88.2	94.9	90.3	93.7
2.	Haryana	39.6	46.7	61.1	76.3	76.5
3.	Himachal Pradesh	22.7	28.7	52.7	70.2	76.1
4.	Jammu & Kashmir	32.5	36.1	50.3	70.9	75.2
5.	Punjab	52.6	52.1	68.9	80.8	78.3
6.	Rajasthan	38.1	41.4	50.1	64.2	54.4
7.	Uttarakhand	-	-	49.8	64.5	75.7
8.	Chhattisgarh	-	-	21.7	35.9	43.2
9.	Madhya Pradesh	13.8	19.2	26.2	35.7	45.2
10.	Uttar Pradesh	20.1	24.8	28.8	33.1	40.5
11.	Bihar	15.5	15.5	20.4	25.9	34.0
12.	Jharkhand	-	-	28.3	37.9	42.8
13.	Odisha	9.5	14.8	31.9	44.5	59.0
14.	West Bengal	22.5	32.8	39.5	46.5	52.5
15.	Arunachal Pradesh	2.2	14.2	20.8	23.9	24.5
16.	Assam	2.2	10.9	19.8	25.2	31.6
17.	Manipur	4.9	7.1	10.7	17.7	22.6
18.	Meghalaya	3.9	14.5	35.1	43.0	45.0
19.	Mizoram	6.0	16.2	22.9	54.7	50.5
20.	Nagaland	8.4	18.1	20.7	28.4	33.5
21.	Sikkim	-	50.6	51.0	71.6	75.7
22.	Tripura	3.1	-	12.1	26.6	33.0
23.	Goa	54.0	51.0	73.0	84.2	90.0
24.	Gujarat	33.2	45.2	67.3	77.1	77.2
25.	Maharashtra	30.6	28.3	59.0	72.9	76.8
26.	Andhra Pradesh	31.3	39.9	56.3	81.5	84.6
27.	Karnataka	16.5	41.2	55.1	62.9	63.7
28.	Kerala	19.9	79.8	85.1	89.0	83.4
29.	Tamil Nadu	22.7	27.6	69.9	78.9	87.9
30.	Telangana			-	75.0	79.2
India		23.7	32.0	45.9	56.3	60.3

Source: International Institute for Population Sciences (IIPS) and Government of India; Ministry of Health And Family Welfare, New Delhi, National Family Health Survey-1 to 5.

cultural and economically marginalized by the governments under housing schemes. But still in N.F.H.S-5 period, 30.0 percent in India and over half of sampled households were not living in a pucca house in the states like Madhya Pradesh, Uttar Pradesh, Bihar, Arunachal Pradesh, Assam, Manipur, Meghalaya and Tripura. This clearly indicates that significant percent of households not had living in a pucca house in India and its states due to poor socio-economic, cultural and geographical reasons though pucca house is being the one of basic need of human being to live comfortably.

Person per room

The measure of crowding known as "persons per room" takes into account all the rooms in a private dwelling and the number of people living in the household. A higher value for "persons per room" indicates a greater level of crowding. In India, approximately 3.9 percent of households do not have rooms specifically designated for residential purposes⁽¹⁾. According to the Census 2011 data, there are 43,813 families living in shared rooms, with nearly 40,000 of them located in urban Delhi. This data clearly highlights a significant proportion of the lower middle class residing in shared rooms



Table 6. Percent of households with mean number of persons per room used for sleeping in India and its states

S. No	India/ State	NFHS-1	NFHS-2	NFHS-3	NFHS-4	NFHS-5
		(1992-93)	(1998-99)	(2005-06)	(2015-16)	(2019-21)
		Total	Total	Total	Total	Total
1.	Delhi	2.6	2.2	3.1	2.9	2.8
2.	Haryana	2.9	2.4	3.3	2.7	2.7
3.	Himachal Pradesh	2.1	1.8	2.5	2.1	2.0
4.	Jammu & Kashmir	2.8	2.2	2.9	2.5	2.1
5.	Punjab	2.7	2.1	3.1	2.7	2.6
6.	Rajasthan	3.0	3.0	3.6	3.0	2.7
7.	Uttarakhand	-	-	3.0	2.7	2.5
8.	Chhattisgarh	-	-	3.0	2.8	2.4
9.	Madhya Pradesh	2.8	2.9	3.6	3.1	2.8
10.	Uttar Pradesh	3.0	3.1	3.8	3.4	3.0
11.	Bihar	2.8	2.9	3.3	3.3	3.0
12.	Jharkhand	-	-	3.2	2.7	2.4
13.	Odisha	2.4	2.4	3.1	2.8	2.5
14.	West Bengal	2.8	2.7	3.1	2.7	2.4
15.	Arunachal Pradesh	2.9	2.2	2.7	2.1	1.7
16.	Assam	2.4	2.1	2.7	2.3	2.1
17.	Manipur	2.1	2.1	2.6	2.4	2.3
18.	Meghalaya	2.1	2.0	2.9	2.3	2.3
19.	Mizoram	2.0	2.6	3.5	3.0	2.6
20.	Nagaland	1.9	1.6	2.6	2.1	1.6
21.	Sikkim	-	2.0	2.3	1.9	1.5
22.	Tripura	2.4	-	2.9	2.4	2.3
23.	Goa	1.8	1.6	2.7	2.4	2.2
24.	Gujarat	3.3	2.7	3.6	3.2	3.0
25.	Maharashtra	3.2	3.0	3.5	3.2	2.9
26.	Andhra Pradesh	2.8	2.9	3.2	2.9	2.7
27.	Karnataka	2.7	2.5	3.4	2.7	2.5
28.	Kerala	1.4	1.3	2.2	1.8	1.8
29.	Tamil Nadu	2.5	2.2	2.9	2.4	2.3
30.	Telangana	-	-	-	3.0	2.6
India		2.8	2.7	3.3	2.9	2.7

Source: International Institute for Population Sciences (IIPS) and Government of India; Ministry of Health And Family Welfare, New Delhi, National Family Health Survey-1 to 5.



within the city's population.

Table 6 reveals the significant variations across in India and its states in mean number of persons per room used for sleeping during N.F.H.S 1 of 1992-93 to N.F.H.S-5 of 2019-21. On an average 2.5 mean number of persons per room used for sleeping in India and in many states. However, over 2.5 mean number of persons per room used for sleeping in states like Delhi, Haryana, Himachal Pradesh, Punjab, Rajasthan, Madhya Pradesh, Mizoram, Maharashtra, Andhra Pradesh, Kerala Andhra Pradesh, and highest being 3.0 mean number of persons in Uttar Pradesh, Bihar, Gujarat in N.F.H.S-5 period. In states with higher mean number of persons per room used for sleeping can be problems such as individual privacies, congested and health issues especially such as the period of Covid-19 etc.

Conclusion

Drastic improvement had observed in house hold electricity and improved source of drinking water during the period of N.F.H.S-1 to N.F.H.S-5. All most of sampled households' access to have electricity (97%) and over 95.0 percent of households have access to improved source of drinking water in India and its states in N.F.H.S-5. However, less than 25.0 percent of household had not having any toilet facility in states like Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Odisha, Gujarat, Maharashtra, Andhra Pradesh, Karnataka Tamil Nadu and Telangana in the period of N.F.H.S-5. Substantial variations have observed across in India and its states in households with use of solid fuel for cooking. Over 50.0 percent of households used solid fuel for cooking in India and its many states. This could lead to lungs and heart diseases. Over 2.5 mean number of persons per room used for sleeping in states like Delhi, Haryana, Himachal Pradesh, Punjab, Rajasthan, Madhya Pradesh, Mizoram, Maharashtra, Andhra Pradesh, Kerala, Andhra Pradesh, Telangana and highest being 3.0 mean persons per room used for sleeping observed in Uttar Pradesh, Bihar and Gujarat, can be cause to problems such as personal and health. Therefore, the N.G.Os and govern agencies should make better inclusive policies related sanitation/toilet, clean fuel for cooking and pucca house for poor/ marginalized sections that are the highest level of deprivation and contributing to poor health, high

mortality and low quality of living.

References

- 1) Ansary R, Das B. Regional Patterns of Deprivation in India: An Assessment Based on Household Characteristics, Basic Amenities and Asset Possession. *Social Change*. 2018;48(3):367–383. Available from: <https://doi.org/10.1177/0049085718781663>.
- 2) Kan Z, Kwan MP, Ng MK, Tieben H. The Impacts of Housing Characteristics and Built-Environment Features on Mental Health. *International Journal of Environmental Research and Public Health*. 2022;19(9):5143–5143. Available from: <https://doi.org/10.3390/ijerph19095143>.
- 3) Das B, Mistri A. Household quality of living in Indian states: Analysis of 2011 Census. 2013. Available from: <https://doi.org/10.1177/0975425313477759>.
- 4) Bhagat R, Unisa S, Dewaram N, Fulpagare P. Food Security and Health Status: A Comparative Study of Tribal and Non-Tribal Households. 2018. Available from: https://www.researchgate.net/publication/326914180_Food_Security_and_Health_Status_A_Comparative_Study_of_Tribal_and_Non-Tribal_Households.
- 5) Yakubu I, Akaateba MA, Akanbang BAA. A study of housing conditions and characteristics in the Tamale Metropolitan Area, Ghana. *Habitat International*. 2014;44:394–402. Available from: <https://doi.org/10.1016/j.habitatint.2014.08.003>.
- 6) Zhou M, Guo W. Housing characteristics and health in urban China: A comparative study of rural migrants and urban locals, Population, Space and Place. 2022. Available from: <https://doi.org/10.1002/psp.2600>.
- 7) Löfstedt M. New CASE study: The Relationship between Physical Housing Characteristics, Housing Accessibility and Different Aspects of Health among Community-Dwelling Older People: A Systematic Review. 2023. Available from: www.case.lu.se/en/article.
- 8) Coley RL. Relations between Housing Characteristics and the Well-Being of Low-Income Children and Adolescents. 2013;49:1775–1789. Available from: <https://doi.org/10.1037/a0031033>.
- 9) Dekker K, De Vos S, Musterd S, Van Kempen R. Residential Satisfaction in Housing Estates in European Cities: A Multi-level Research Approach. 2011;26:479–499. Available from: <https://doi.org/10.1080/02673037.2011.559751>.
- 10) Schipper D. The Effect of Housing Characteristics on Subjective Well-being in the United Kingdom, Bachelor Project Human Geography & Urban and Regional Planning University of Groningen. 2020.
- 11) Attia AE. The Relationship between the Characteristics of Rural Housing and Some Social and Economic Variables for Its Inhabitants : A Field Study Applied To A Village In Sharkia Governorate. *Journal of Environmental Sciences*. 2023. Available from: https://jes.journals.ekb.eg/article_290719.html.
- 12) Lu Y, Gao W, Kuroki S, Ge J. Household characteristics and electricity end-use under dynamic pricing in the collective housing complex of a Japanese smart community. *Journal of Asian Architecture and Building Engineering*. 2022;21(6):2564–2579. Available from: <https://doi.org/10.1080/13467581.2021.1987244>.
- 13) Lavelle M. The Solvable Problem of Energy Poverty. *National Geographic*. 2010.