

## Research Paper

# Discrimination between scheduled and non-scheduled groups in access to basic services in urban India

Tarun Arora<sup>a</sup> and Prashant Kumar Choudhary<sup>id b,\*</sup>

<sup>a</sup> Department of Professional Studies, CHRIST (Deemed to be University), Bangalore, India

<sup>b</sup> Department of Public Policy, Manipal Academy of Higher Education, Manipal, India

\*Corresponding author. E-mail: pkbharat@gmail.com; prashant.choudhary@manipal.edu

 PKC, 0000-0002-7778-286X

## ABSTRACT

Access to basic services such as water, sanitation, and electricity is a key determinant of an individual's well-being. Nevertheless, access to these services is unequally distributed among different social groups in many countries. India is no exception, with the scheduled castes (SC) and scheduled tribes (ST) being one of the country's most marginalised and disadvantaged groups. This paper analyses the disparities in access to basic services between scheduled and non-scheduled households, investigates the factors contributing to the unequal access, and suggests policy recommendations. Using data from the National Sample Survey 76th Round, we analyse the access to basic services such as durable housing, improved water and sanitation, and access to electricity. The paper's objectives are (a) to investigate the factors impacting the quality of basic service delivery in urban India separately for scheduled and non-scheduled households and (b) to quantify the discrimination between scheduled and non-scheduled households in urban India concerning access to quality of basic services through computing a comprehensive index and by using the 'Fairlie decomposition' approach. The analysis corroborates the finding that systemic discrimination exists between scheduled and non-scheduled households in urban India regarding access to good quality basic services up to an extent of 24%.

**Key words:** access, basic services, discrimination, inequality, urban

## HIGHLIGHTS

- Scheduled groups in India, including the scheduled castes and scheduled tribes, have historically faced discrimination and social exclusion, which has impacted their access to basic services.
- Despite affirmative action programs and policies, scheduled groups continue to face challenges in accessing these services due to systemic discrimination, lack of infrastructure, and cultural biases.

## 1. INTRODUCTION

Access to basic services includes the right to housing, education, energy, and health, among other necessities for meeting human needs and ensuring a respectable existence. Basic services like clean drinking water, housing, electricity, and sanitation are essential to one's well-being because they improve one's standard of living and physical comfort (Rao & Min 2018). People also gain through positive externalities such as bettering the environment and health and other benefits such as greater privacy and dignity associated with improved sanitation (Hutton *et al.* 2007; Kumar 2014; Hutton 2015).

However, being able to access a decent quality of life is a significant issue for vulnerable communities worldwide because of last mile delivery issues on the supply side, which includes transparency and capacity-related challenges (Afridi 2017). Cities, the places of economic opportunities and the engines of growth, attract many people from rural areas. However, in low- and middle-income countries such as India, the most significant urban areas are already under stress from unchecked and unsustainable levels of rural–urban migration; this crisis affects the poor, especially minorities and scheduled groups (scheduled castes/scheduled tribes (SC/STs)) (Sharma & Abhay 2022). Scheduled groups in India, including the SC and ST, have historically faced discrimination and social exclusion, which has impacted their access to basic services. Growing evidence shows

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence (CC BY 4.0), which permits copying, adaptation and redistribution, provided the original work is properly cited (<http://creativecommons.org/licenses/by/4.0/>).

that urbanisation in India has resulted in minorities and Dalits–Adivasis (SC/STs)<sup>1</sup> getting pushed to the margins of cities with poorer living conditions than the mainstream population (Ahmad 2012; Sidhwani 2015; Susewind 2017; Chandran 2018; Arora & Pyle 2022).

Hence, with the development process, growing urbanisation is accompanied by potential inequality traps in income, consumption, housing, assets, education, health, and unemployment (Bhan & Jana 2015) resulting in Minorities, SCs, and STs being segregated from the mainstream and remain in clusters. Despite affirmative action programs and policies, scheduled groups continue to face challenges in accessing these services due to systemic discrimination, lack of infrastructure, and cultural biases. However, non-scheduled groups have better access to basic services due to their socioeconomic advantage, which has led to a widening gap between the two groups.

Furthermore, the available literature on urban dynamics, especially in Indian cities, has primarily focused on class markers despite evidence that caste is implicated in access to economic resources and opportunities even in modern sectors of India (Thorat & Neuman 2012). Few studies focused on the castes as a reference for the analysis of inequalities. Miklian & Sahoo (2016) do so but only in three Indian towns and found that instead of serving as ‘melting pots’ and hubs for upward social mobility, Indian cities stubbornly replicate the country’s rural social and economic reality. They discovered that Muslims and Dalits found it difficult to escape the inherent discrimination in a city, forcing them to dwell on the periphery and in segregated areas (Bharathi *et al.* 2019).

Residential segregation maintains the current social and economic divides and eventually threatens prosperity (Carr & Kutty 2008). In Indian cities, individuals are often denied access to the housing of their choice based on the caste to which they belong (Thorat *et al.* 2015). Schelling (1971) in his seminal paper showed that this simple act of denial or a small preference for one’s neighbours to be of the same caste/race could lead to residential segregation, where different social groups live separately instead of together as a community. Such preferences directly or indirectly will give rise to highly segregated neighbourhoods and localities based on caste, and often the distribution of public services and goods is decided based on the type of caste-based neighbourhood (Miklian & Sahoo 2016).

Hence, the objective of the paper is to empirically estimate with scientific rigour and sophisticated methodology to which extent belonging to a particular social group has any bearing on access to basic services in urban spaces. It is essential to further investigate these inequalities under the lens of caste inequalities, especially considering that 17.4% of urban India<sup>2</sup> (as per Census 2011) lives in slum<sup>3</sup> conditions, and there is evidence that the population usually pushed into the margins are indeed the SCs and STs. The second part of the paper delves into the dataset and the methods used for analysis, and the following sections deal with statistical analysis, results, and discussion. The last section provides the concluding remarks.

### 1.1. Theoretical underpinning and hypothesis

India is a stratified society, which is based on the caste system. The system favours some groups (general/forward castes) and punishes some (SC and ST) in the form of access to education, land, jobs, etc., which is contrary to Article 2 of the Universal Declaration of Human Rights that establishes that everyone is entitled to rights without distinction of any kind, which includes the human rights to water and sanitation (United Nations n.d.). Heller (2020), in the special rapporteur report on the human rights to water and sanitation, also talks about horizontal equalities and refers to them as realisations where horizontal realisation is about reducing the gaps in access to water and sanitation among individuals and groups.

The horizontal inequality school of thought argues that inequalities exist between groups with distinct identities (Stewart 2017). According to Stewart (2005), the disparities between people primarily because of the group(s) to which they belong, caste, gender, ethnicity, handicap, etc., are termed horizontal inequality.

<sup>1</sup> SC and ST are considered marginalised communities in India and the state protects them by providing affirmative action in jobs and education. Available from: <https://pib.gov.in/newsite/PrintRelease.aspx?relid=147326>.

<sup>2</sup> Available from: [https://timesofindia.indiatimes.com/india/17-of-urban-india-lives-in-slums-census/articleshow/19118219.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](https://timesofindia.indiatimes.com/india/17-of-urban-india-lives-in-slums-census/articleshow/19118219.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst) (accessed 22 October 2023).

<sup>3</sup> UN defines slum as a group of individuals living under the same roof in an urban area, lacking in one or more of the following five amenities: (1) durable housing (a permanent structure protecting from extreme climatic conditions); (2) sufficient living area (no more than three people sharing a room); (3) access to improved water (water that is sufficient, affordable, and can be obtained without extreme effort); (4) access to improved sanitation facilities (a private toilet, or a public one shared with a reasonable number of people); and (5) secure tenure (*de facto* or *de jure* secure tenure status and protection against forced eviction) (Nolan 2015).

There has been a plethora of attempts to assess this unequal access or residential segregation in urban India when it comes to basic services, and the most prominent works include the contribution by [Bharathi \*et al.\* \(2022\)](#); their study highlighted that the supply side discrimination is evident through reduced availability of piped services in wards with a higher proportion of SC/ST households. [Kumar \(2015\)](#) found out that households located in slums and small and medium towns/cities and those belonging to the poor, ST, SC, and wage labourers (casual labourers) were highly deprived of access to basic amenities.

[Kundu & Banerjee \(2018\)](#) looked at migrant and non-migrant populations and saw that the situations were far more precarious for migrants who were poor and belonged to socially marginalised groups. [Singh \*et al.\* \(2019\)](#) did a city-wise analysis and found out that in 60% of the cities of their all-India sample, residential segregation based on caste or tribe still existed or was getting worse, with variations depending on the region and size of the city. Furthermore, studies have explored and empirically established that there is discrimination in different aspects of society such as health parameters ([Summan \*et al.\* 2022](#)), access to government programs ([Mishra \*et al.\* 2021](#)), and job market ([Madheswaran & Attewell 2007](#)).

Our study looks at inequalities in access to basic services between two castes using the technique of decomposing inter-group differences that allows us to determine to which extent the gaps between SC/STs and non-SC/STs are caused by discrimination. Moreover, the studies measured the differences using individual parameters such as access to water, sanitation, and employment, rather than a comprehensive index-based approach ([Kulkarni \*et al.\* 2017](#); [Dutta \*et al.\* 2018](#)). In this paper, an attempt is made to create a single indexed parameter for the quality of basic services comprising four critical services to any household and measure the 'level of discrimination' in access to basic services that the scheduled groups face vis-à-vis the non-scheduled groups. Thus, the hypothesis is that significant discrimination exists in urban India that the SC/STs face just because they belong to this particular group compared to non-SC/ST households.

## 2. MATERIALS AND METHODS

The National Sample Survey Office (NSSO) has been collecting data on 'Housing Conditions and Other Amenities' almost since its inception. Data on the structural aspects of dwelling units and basic housing amenities, such as drinking water, bathrooms, sewerage, latrine, and lighting, are available to the households<sup>4</sup>. The most recent data on the same theme released by the NSSO was the 76th round in December 2018. The National Sample Survey (NSS) data are comprehensive and nationally representative on the quality of basic services. The data are extracted for urban India to analyse urban households only<sup>5</sup>, both scheduled and non-scheduled<sup>6</sup>.

### 2.1. Variables used in the study

#### 2.1.1. Outcome variable

The dependent variable comprises four parameters related to access to basic services: the quality of housing, sanitation, water quality, and availability of electricity in the household. House is categorised as 'durable' and 'not durable' using the Demographic and Health Survey (DHS) definition, also used by the National Family Health Survey (NFHS) in India. The NSS data collects only the details of the material used to construct the roof and wall separately. Using the details of materials categorised as 'Pucca (durable)' and 'Kutchra (not durable)', we have created the variable for the durability of households.<sup>7</sup>

<sup>4</sup> To know more about the data, see <https://mospi.gov.in/unit-level-data-report-nss-76th-round-schedule-12-july-december-2018-drinking-water-sanitation> (accessed 22 October 2023).

<sup>5</sup> The NSS data are a nationally representative and the most credible dataset that the Government of India produces on multiple indicators. The NSS 76th round used here for the analysis represents the whole of India as it is collected using robust sampling frames and techniques. Extracted urban data (since this is an urban study) from the overall data similarly represent the entire urban India. We have not picked any specific urban areas for the analysis, but the overall sampled urban India and the data are representative. To know more about how urban sampling frames are created, visit <https://mospi.gov.in/urban-frame-surveyufs>.

<sup>6</sup> The SC/ST communities in India are different with regards to their history, culture, and groups within. However, both these groups are studied together at the economic and societal levels. Indian state too puts them in the same group while implementing a program/policy for them. The primary reason for this could be that these two groups exhibit similar trends over the year on several developmental parameters. In addition, in the Indian constitution, these two groups are together considered as 'scheduled'.

<sup>7</sup> The household is considered Durable (Pucca) only if the material used to create the walls and the roof are both durable. The household will be considered non-durable even if either of the two (roof, wall, or both) is constructed using non-durable material.

Sanitation is directly grouped into ‘improved’ and ‘unimproved’ sources using the DHS definition<sup>8</sup>. Similarly, water quality is classified into ‘improved’ and ‘unimproved’ using the metric provided by the DHS<sup>9</sup>. The availability of electricity is codified into ‘yes’ for the household that has access to electricity and ‘no’ for the one that does not have an electricity connection at their house.

The dependent variable is, therefore, a composite index that contains the above-mentioned four parameters representing the quality of basic services. If any household has all four facilities, i.e., durable household, access to electricity, access to ‘improved’ water, and ‘improved’ sanitation, it is coded as having access to ‘good quality’ of basic services and will be scored 1, else scored 0 as having access to ‘compromised quality’ of basic services. This dependent categorical variable is subsequently analysed for scheduled and non-scheduled groups in the urban area.

### 2.1.2. Independent variables

The study includes several independent variables that were considered able to explain our dependent variable. Since the paper compares the scheduled and non-scheduled households, we have categorised caste groups into scheduled (SC/ST) and non-scheduled (OBC and others). Gender is similarly grouped into male (coded ‘0’ as reference category) and female (coded as ‘1’). Marital status is recoded into three groups: ‘others’ (base category and recoded as ‘0’), single, and married.

The education of a respondent is grouped into four categories: illiterate, below primary, primary to secondary, and ‘above secondary’ where ‘illiterate’ is the base category. For our study, religion is classified into three categories, with ‘others’ being the base category (Hinduism and Islam are other religions). There is enough evidence to prove that access to information through education or any other means can improve service delivery (Tiebout 1956; Corburn 2009; López-Moctezuma *et al.* 2022; Wantchekon 2017). The household size in urban areas was approximately 4.4; in our analysis, we have divided the data into two as ‘up to five’ and ‘above five’ where the former is the reference category. We believe household size has a direct relation with the quality of basic service delivery. A higher number of members depending on limited sources would surely affect the household’s capacity (Corburn 2009).

Apart from the demographic variables, the study also included important variables to evaluate the discrimination between scheduled and non-scheduled groups. In this regard, the variable regarding the availability of a household garbage disposal system is taken. Access to solid waste disposable collection systems is certainly a factor that is directly related to the quality of basic services (Post *et al.* 2003). In addition, the drainage system is incorporated into our study, where ‘no drainage system’ is taken as the reference category for the analysis. Furthermore, whether the house is connected to a constructed road or not is explored too (base category is non-availability of the constructed path). The lack of properly constructed roads in many cases creates hindrances for municipalities to access the households to collect garbage and provide other basic services (Hindman *et al.* 2015).

The availability of ‘type of fuel’ is also added, where ‘others’ is taken as the base category. An individual’s employment is an important aspect of a household; hence, we have categorised it into employed and unemployed (unemployed as a reference category). Drinking water is grouped into two: treated and non-treated, with the latter being the base category. For a household, the ownership of it is an important measurement of its economic and social status. In our analysis, we have included ‘others’ as the base category (rented and owned are the remaining two categories). The availability of a washroom and bathroom inside the household is an important variable for our study; its non-availability is considered the reference category.

In urban areas, dwelling types grouped as slum and non-slum are also considered for our analysis, where slum is the base category. In addition, the availability of sufficient water to a household throughout the year is equally important (non-availability of sufficient water is the reference category).

Income is an important determinant as far as access to basic services is concerned. The rich certainly get better access through networks, while the poor do not have these networks (Heller *et al.* 2023). Hence, we added an independent variable in the study, the monthly expenditure of a household in urban areas in India. There are different opinions<sup>10</sup> on how much the monthly expenditure in urban areas for a family of five not be considered as ‘poor’, i.e., the cut-off/line/below poverty line

<sup>8</sup> For improved and unimproved sanitation categories, see [https://dhsprogram.com/data/Guide-to-DHS-Statistics/Type\\_of\\_Sanitation\\_Facility.htm](https://dhsprogram.com/data/Guide-to-DHS-Statistics/Type_of_Sanitation_Facility.htm) (accessed 6 June 2023).

<sup>9</sup> For improved and unimproved water categories, see [https://dhsprogram.com/data/Guide-to-DHS-Statistics/Household\\_Drinking\\_Water.htm](https://dhsprogram.com/data/Guide-to-DHS-Statistics/Household_Drinking_Water.htm) (accessed 6 June 2023).

<sup>10</sup> See <https://scroll.in/article/1021052/what-statistics-miss-even-households-earning-eight-times-the-poverty-line-suffer-from-deprivation> (accessed 6 June 2023).

(BPL) for the urban population in India is highly debatable. Considering all the recommendations of earlier reports and adjusting the inflation, we have fixed this line at 7,000 INR for a family of five in an urban area as our poverty line. For our analysis, it is categorised as below and above 7,000 INR monthly expenditure.

### 3. STATISTICAL ANALYSIS

Blinder (1973) and Oaxaca (1973) developed an approach to measure discrimination in the labour market between whites and blacks or white males–females. It is frequently used to analyse the gaps in wages or income between various demographic categories, including race and gender. It divides the wage differential between two groups into a part that is ‘explained’ by group differences in productivity characteristics, such as education or work experience and a residual part that cannot be accounted for by such differences in wage determinants. This ‘unexplained’ part is often used as a measure for discrimination, but it also subsumes the effects of group differences in unobserved predictors (Jann 2008). We have attempted to use a similar decomposition technique in the context of capturing discrimination in accessing the quality of basic services between SC/STs and non-SC/STs.

However, we could not use the Oaxaca–Blinder method in our study as our outcome variable is non-linear binary (0, 1). For our analysis, we have applied the Fairlie decomposition (Fairlie 2005) where the ‘explained’ portion of the gap is the difference in the outcome attributable to group differences in levels of a set of measured predictor variables between the ‘advantaged’ (non-SC/ST in our case) and the ‘disadvantaged’ (SC/ST in our case) groups. The ‘unexplained’ portion arises from differentials in how the predictor variables are associated with the outcomes for the two groups. This portion would persist even if the disadvantaged group were to attain the same average levels of measured predictor variables as the advantaged group (Sen 2014). This unexplained proportion is termed as discrimination in Fairlie’s analysis.

$$Y^n - Y^s = \left[ (X^n - X^s)\hat{\beta}^n \right] + \left[ X^s(\hat{\beta}^n - \hat{\beta}^s) \right]. \quad (1)$$

$Y^n$  and  $Y^s$  represent access to basic services for non-scheduled and scheduled, respectively. The first term (in the bracket) denotes the explained difference that exists due to endowment differences between SC/ST and non-SC/ST, whereas the second term in the bracket is due to unexplained or unmeasurable endowments between the two.

As a first step, we performed logistic regression analysis and then applied the method to complete the Fairlie’s decomposition, which is run separately to calculate differences in coefficients; finally, we measured the discrimination by estimating the difference between explained and unexplained portions.

### 4. RESULTS AND DISCUSSION

This section deals with, first, the descriptive statistics of each group followed by the results of separate logistic regressions performed for both SC/STs and non-SC/STs groups and result analysis. Finally, it presents the results of Fairlie’s decomposition, which sheds light on the disparities between these two groups to determine the discrimination.

Table 1 shows the descriptive findings of different variables selected between SC/ST and non-SC/ST groups.

In general, SC/ST groups are more disadvantaged in comparison to non-SC/ST, always showing slightly lower values (2–5% lower for most of the variables). The ones that stand out vary from 7 to 13% and are related to drinking water and sanitation services, infrastructure (availability of washroom and bathroom inside the house), income, and higher education. Regarding the group characteristics, religion is shown to be quite different, whereas Hinduism seems to be more common among SC/ST groups, although also quite present among non-SC/ST. Furthermore, another set of notable differences of 7 and 6.5% between SC/STs and non-SC/STs were found for the population living in slums and monthly expenditure, respectively.

Table 2 shows the regression analysis for the access to basic services between the SC/ST and non-SC/ST groups in terms of odds ratio<sup>11</sup>. The odds ratio shows to which extent an increase in an independent variable increases or decreases the odds of people having access to ‘good quality’ services within a group. If it is higher than 1, it means it will increase the odds; if it is less than 1, it will decrease it. To start with, we will analyse the logistic regression for the SC/ST group.

<sup>11</sup> The odds ratio represents the odds that an outcome will occur given a particular exposure compared to the odds of the outcome occurring without that exposure (Szumilas 2010).

**Table 1** | Percentage distribution of selected variables between SC/ST and non-SC/ST groups

<b>Variables</b>	<b>SC/ST</b>	<b>Non-SC/ST</b>
Sex		
Male	82.8	86.8
Female	17.2	13.2
Marital status		
Married	73.5	78.7
Single	12.7	9.6
Others	13.8	11.7
Education		
Illiterate	22.2	12.1
Below primary	8.2	7.1
Primary to secondary	40.6	38.9
Above secondary	29.0	41.9
Religion		
Hinduism	86.4	77.0
Islam	1.6	17.4
Others	12.0	5.6
Household size		
Up to Five	82.0	84.3
Above Five	18.0	15.7
Garbage disposal		
No arrangement	24.3	16.1
Have arrangement	75.7	83.9
Drainage system		
No drainage system	13.7	6.8
Have drainage system	86.3	93.2
Constructed path availability		
No constructed road	6.0	3.9
Have constructed road	94.0	96.1
Fuel facility		
LPG	80.9	87.8
Non-LPG	13.6	8.4
Others	5.5	3.8
Employment		
Unemployed	24.7	25.0
Employed	75.3	75.0
Drinking water		
Non-treated	60.0	49.0
Treated	40.0	51.0
Status of dwelling		
Rented	31.5	33.2
Owned	60.7	64.5
Others	7.8	2.3

*(Continued.)*

**Table 1** | Continued

Variables	SC/ST	Non-SC/ST
Availability of washroom and bathroom inside house		
No	23.8	11.7
Yes	76.2	88.3
Availability of sufficient water		
No	12.0	8.0
Yes	88.0	92.0
Dwelling type		
Slum	13.2	6.0
Non-slum	86.8	94.0
Monthly expenditure		
Less than 7,000 INR	22.5	14.2
More than 7,000 INR	77.5	85.8

The highest odds in favour of ‘good quality basic services’ for both SC/STs and non-SC/STs groups are related to access to fuel facility and bathroom and washroom availability inside the house. Both have a direct bearing on improving the overall quality of basic services. Access to fuel helps in improving the quality of water by decontaminating it (Walton 2018), and access to ‘bathroom and washroom availability inside the house’ improves the access and quality of sanitation that any household uses. Even though having higher education and living in a non-slum household should have had higher odds in favour of access to good quality services, our results are not as expected. We believe income can transcend the impact of education and the type of dwelling (slum/non-slum) because some people do not have a formal job, or if they do not have higher education but still have a good income, this will determine more strongly their chances of having good quality services.

Our analysis shows that a household having both a washroom and bathroom inside has 7.2 and 4.8 times higher odds of having access to ‘good quality’ basic services for SC/ST and non-SC/ST households, respectively, compared to those that do not have a washroom and bathroom inside. Similarly, households with access to non-LPG fuel facilities have 7.4 and 3.5 times higher odds of having ‘good quality’ basic services for SC/ST and non-SC/ST households, respectively, in comparison to households with ‘Other’ type of fuel facility.

For SC/ST households, access to infrastructure such as the availability of constructed roads or drainage and garbage disposal systems presented a significant relationship with access to ‘good quality’ basic services. Within the SC/ST group, the odds of people having access to ‘good quality’ services are 1.7 higher if they have access to the drainage system, in comparison to those who do not. Similarly, having garbage disposal increases the odds of having access to ‘good quality’ services by 60% (1.6 times higher), the same as expenditure, which also shows a strong relationship. At last, having properly constructed roads shows an increase of 50% in the odds of access to ‘good quality’ services. In addition, SC/ST households that are connected to the properly constructed road have 1.5 higher odds of having access to ‘good quality’ basic services compared to those that are not connected to the constructed road. For SC/STs, employment does not guarantee access to ‘good quality’ basic services. For them, the odds of having access to ‘good quality’ basic services decrease by 0.7 for a household with an employed member compared to those with none. However, that is not the case when it comes to household expenditure. An SC/ST household with a monthly expenditure of more than 7,000 INR has higher odds of having access to ‘good quality’ basic services in urban areas.

For non-SC/STs, a household with a female head has lower odds of having access to ‘good quality’ basic services compared to one with a male head. Compared to households with ‘Other’ religion, Hindu and Muslim households have lower odds of having access to ‘good quality’ basic access. A household with more than five members has 1.14 higher odds of access to ‘good quality’ basic services compared to a household with less than five members. Like SC/ST, non-SC/ST households having arrangements of garbage disposal and drainage systems connected to the house have higher odds of access to good quality basic services compared to those that have none. In comparison, the odds for non-SC/ST households are higher compared to SC/ST households in both cases; however, the difference is not remarkable in the case of drainage but is quite stark in the case of garbage disposal. Unlike SC/ST, the employment status of non-SC/ST households does not have a significant relationship with access to basic

**Table 2** | Logistic regression for access to basic services between SC/ST and non-SC/ST groups

Variables	SC/ST		Non-SC/ST	
	Odds ratio	Standard error	Odds ratio	Standard error
Sex (male)				
Female	1.07	0.144	0.704***	0.061
Marital status (others)				
Married	0.906	0.122	1.018	0.088
Single	0.666**	0.127	0.535***	0.076
Education (illiterate)				
Below primary	0.730***	0.086	0.977	0.076
Primary to secondary	0.710***	0.061	0.826***	0.049
Above secondary	0.458***	0.053	0.473***	0.034
Religion (others)				
Hinduism	0.653***	0.055	0.538***	0.040
Islam	1.193	0.225	0.527***	0.044
Household size (up to five)				
Above five	0.912	0.074	1.141**	0.063
Garbage disposal (no arrangement)				
Have arrangement	1.635***	0.116	3.027***	0.134
Drainage system (no)				
Have drainage system	1.714***	0.138	1.953***	0.110
Constructed path availability (no)				
Have constructed road	1.528***	0.170	1.037	0.088
Fuel facility (others)				
LPG	2.518***	0.907	1.146	0.244
Non-LPG	7.450***	2.703	3.540***	0.762
Employment (unemployed)				
Employed	0.777***	0.073	0.951	0.053
Drinking water (non-treated)				
Treated	0.718***	0.052	0.655***	0.029
Status of dwelling (others)				
Rented	0.483***	0.071	0.541***	0.069
Owned	0.881	0.117	1.087	0.134
Availability of washroom and bathroom inside house (no)				
Yes	7.262***	0.527	4.872***	0.231
Availability of sufficient water (no)				
Yes	1.170	0.114	1.517***	0.097
Dwelling type (slum)				
Non-slum	0.705***	0.072	0.769***	0.068
Monthly expenditure (less than 7,000 INR)				
More than 7,000 INR	1.608***	0.126	1.428***	0.075
Constant	0.601	0.344	2.177**	0.820
Sample (N)	9,389	33,682		
Log Likelihood	-3,185.55	-8,373.51		

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ ; Reference category is given along with the variable name.



services. Furthermore, if a household can spend more than 7,000 INR, then the odds of having access to ‘good quality’ basic services increases. Comparing homes with those without indoor bathrooms, those with bathrooms inside their premises have higher chances of having access to ‘good quality’ basic services. Like SC/ST, a ‘rented’ non-SC/ST household has lower odds of having access to good quality basic services. The odds of having access to ‘good quality’ basic services are 4.9 times higher if the house has both a washroom and bathroom inside the house for non-SC/ST households.

In conclusion, we argue that variables such as education, type of fuel, access to a washroom and bathroom inside the house, drinking water, and monthly expenditure have a much stronger and significant relationship with access to good quality basic services for both SC/ST and non-SC/ST groups. In contrast, others such as gender, household size, and availability of drinking water do have a significant relationship with the quality of basic services for the SC/ST group. For the non-SC/ST group, access to LPG and constructed path availability do not have a significant relationship with access to good quality basic services. The analysis shows that between two groups (SC/ST and non-SC/ST) in the urban areas, the odds of having access to ‘good quality’ basic services differ according to the set of variables considered in the analysis.

The analysis below calculates the discrimination between them regarding access to good quality basic services.

The Fairlie decomposition results are presented in Table 3. The first part of the table presents the portion that is explained by different variables that are part of the model. The second part of the table shows the unexplained part (i.e., the discrimination between SC/ST and non-SC/ST in accessing good quality basic services).

**Table 3** | Fairlie decomposition analysis of access to basic services by caste groups

S. No.	Covariates	Access to basic service	
		Coefficient	Percentage to the total (%)
1	Sex	0.001**	1.70
2	Education	0.008***	11.6
3	Marital status	-0.0001	-0.03
4	Religion	0.01***	14.8
5	Household size	-0.0004**	-0.63
6	Garbage disposal	0.013***	18.5
7	Drainage system	0.007***	11.2
8	Constructed path availability	0.0001	0.18
9	Employment	0.0001	0.21
10	Drinking water	-0.001***	-1.83
11	Availability of washroom and bathroom inside house	0.02***	28.6
12	Availability of sufficient water	0.0007***	1.16
13	Dwelling type	-0.001***	-2.56
14	Fuel facility	0.011***	16.16
15	Status of dwelling	-0.001***	-2.7
16	Monthly expenditure	0.002***	3.63
	<b>Total (1-16)</b>	<b>0.068</b>	<b>100.0</b>
Decomposition result			
1	Total explained gap	0.068	76.0
2	Total unexplained gap	0.021	24.0
	<b>Total raw differentials (=1 + 2)</b>	<b>0.089</b>	<b>100.0</b>
	Mean prediction of SC/ST	0.806	
	Mean prediction of non-SC/ST	0.896	
	Sample (N)	43, 071	

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

Bold values provide the overall sum of all the coefficients. It also presents the sum explained and unexplained differentials.

The Fairlie decomposition analysis coefficients can be interpreted in the following manner. A positive contribution by variables such as education and garbage disposal in our model presents that a particular variable has increased the gap of access to good quality basic services from SC/ST to the non-SC/ST group, whereas the negative contribution made by variables such as dwelling type and status of dwelling has decreased the gap.

The results indicate that considering all the important variables, only up to 76% of access to basic services can be explained. This implies that some other factors still influence the access to quality basic services and the remaining unexplained percentage of 24% is considered discrimination due to the group differences between non-SC/STs and SC/STs.

However, considering the portion that is explained by the model, most of the gap is explained by the variable garbage disposal (18.5%) and availability of a washroom and bathroom inside the house (28.6%). This indicates that households belonging to non-SC/ST groups have more advantages than their SC/ST counterparts in accessing basic services. Fuel facility is also important in access to basic services, which explains 16.2% of the gap between the two groups. The availability of a drainage system and education also contribute positively to the gap between scheduled and non-scheduled groups (11.2% and 11.6%, respectively).

Even though most factors make a meagre contribution individually, the fact that the variables are positive shows that access to basic services is significantly inclined towards non-SC/STs. Thus, it is evident from our study that SC/ST households face discrimination in access to it due to the prevalence of caste hierarchy in India like other sectors of social and economic development such as jobs, education, and healthcare access.

## 5. CONCLUSION

Many studies previously have attempted to estimate and highlight the discrimination between SC/ST households and non-SC/ST households. For example, Barooah (2005) found that at least one-third of the average income/probability differences between Hindu and SC/ST households were due to the 'unequal treatment' of the latter. Similarly, Coffey *et al.* (2019), Nguyen *et al.* (2021), Mojumdar (2018), etc., did come up with a quantitative figure and explanation for the discrimination between SC/ST and non-SC/ST households in different contexts such as health and others. However, this work stands out because it focused on the quality of basic service delivery using an index approach where a comprehensive understanding of basic service delivery is captured. Based on our findings, the highest explained gap between the two groups is contributed by the availability of washroom and bathroom inside the house, fuel facility, and garbage disposal. The model also provides the proportion of unexplained parts (24%), which is discrimination that the SC/ST group faces in accessing the 'good quality' basic services compared to the non-SC/ST group.

The Government of India has implemented several programs and initiatives to bridge the gap of accessing the quality of basic services between SC/ST and non-SC/ST households, such as Swachh Bharat Abhiyan, which aims to improve sanitation facilities and eradicate open defaecation, and the National Health Mission, which seeks to provide accessible and affordable healthcare to all citizens. However, these programs and policies must be more effectively implemented and targeted to ensure that scheduled groups have equal access to basic services.

Access to basic services and discrimination between scheduled and non-scheduled groups is a complex and multi-faceted issue requiring a comprehensive approach. It is essential to promote equal access to healthcare, sanitation, housing, and other basic services for all individuals, regardless of their caste, religion, ethnicity, or socioeconomic status. This can be achieved through policy interventions, affirmative action programs, and community-based initiatives focusing on enhancing social inclusion and reducing discrimination.

Ultimately, creating a more inclusive and equitable society requires a sustained effort from all stakeholders, including governments, civil society organisations, and individuals, to promote social justice and equality for all. In addition, community-based interventions and awareness campaigns can help reduce discrimination and promote social inclusion. By addressing the root causes of discrimination and promoting equal access to basic services, India can create a more equitable and inclusive society that benefits all its citizens.

## DATA AVAILABILITY STATEMENT

All relevant data are available from an online repository or repositories: <https://www.mospi.gov.in/unit-level-data-report-nss-76th-round-schedule-12-july-december-2018-drinking-water-sanitation>.

## CONFLICT OF INTEREST

The authors declare there is no conflict.

## REFERENCES

- Afridi, F. 2017 Governance and Public Service Delivery in India. *SSRN Working Paper*, pp. 1–33.
- Ahmad, S. 2012 Housing inequality in socially disadvantaged communities: Evidence from urban India, 2009. *Environment and Urbanization Asia* 3 (1), 237–249.
- Arora, T. & Pyle, K. 2022 Sampling and categorization of households for research in urban India. *Studies in Indian Politics* 10 (2), 254–274.
- Barooah, V. 2005 Caste, inequality, and poverty in India. *Rev Development Economics* 9 (3), 399–414.
- Bhan, G. & Jana, A. 2015 Reading spatial inequality in urban India. *Economic and Political Weekly* 50 (22), 49–54.
- Bharathi, N., Malghan, D. & Rahman, A. 2019 Village in the city: Residential segregation in urbanizing India. *IIMB Working Paper Series* 1–47.
- Bharathi, N., Malghan, D., Mishra, S. & Rahman, A. 2022 Residential segregation and public services in urban India. *Urban Studies* 59 (14), 2912–2932.
- Blinder, A. S. 1973 Wage discrimination: Reduced form and structural estimates. *Journal of Human Resources* 8 (4), 436–455.
- Carr, J. H. & Kutty, N. 2008 *Segregation: The Rising Costs for America*. Routledge, New York.
- Census 2011 *Census of India, 2011*. Government of India, New Delhi.
- Chandran, R. 2018 As Indian cities develop, minorities forced into slums. *The Christian Science Monitor*. <https://www.csmonitor.com/World/Asia-South-Central/2018/0117/As-Indian-cities-develop-minorities-forced-into-slums>.
- Coffey, D., Deshpande, A., Hammer, J. & Spears, D. 2019 Local social inequality, economic inequality, and disparities in child height in India. *Demography* 56 (4), 1427–1452.
- Corburn, J. 2009 *Toward the Healthy City: People, Places, and the Politics of Urban Planning*. MIT Press, Cambridge, MA.
- Dutta, S., Sinha, I. & Parashar, A. 2018 Dalit women and water: Availability, access and discrimination in rural India. *Journal of Social Inclusion Studies* 4 (1), 62–79.
- Fairlie, R. 2005 An extension of the Blinder-Oaxaca decomposition technique to logit and probit models. *Journal of Economic and Social Measurement* 30 (4), 305–316.
- Heller, L. 2020 *The Special Rapporteur on the Human Rights to Safe Drinking Water and Sanitation*. United Nations, Geneva.
- Heller, P., Swaminathan, S. & Varshney, A. 2023 The rich have peers, the poor have patrons: Engaging the state in a South Indian City. *American Journal of Sociology* 129 (1), 76–122.
- Hindman, M., Lu-Hill, O., Murphy, S., Rao, S., Shah, Y. & Zhu, Z. 2015 Addressing slum redevelopment issues in India. *Dow Sustainability Fellowship* 2015, 1–63.
- Hutton, G. 2015 Benefits and costs of the water sanitation and hygiene targets for the post-2015 development agenda. *Copenhagen Consensus Center* 1–32.
- Hutton, G., Haller, L. & Bartram, J. 2007 Global cost-benefit analysis of water supply and sanitation interventions. *Journal of Water and Health* 5 (4), 481–502.
- Jann, B. 2008 The Blinder–Oaxaca decomposition for linear regression models. *The Stata Journal* 8 (4), 453–479.
- Kulkarni, S., O'Reilly, K. & Bhat, S. 2017 No relief: Lived experiences of inadequate sanitation access of poor urban women in India. *Gender & Development* 25 (2), 167–183.
- Kumar, A. 2014 Access to basic amenities: Aspects of caste, ethnicity and poverty in rural and urban India—1993 to 2008–2009. *Journal of Land and Rural Studies* 2 (1), 127–148.
- Kumar, A. 2015 Indian urban households' access to basic amenities: Deprivations, disparities and determinants. *Margin: The Journal of Applied Economic Research* 9 (3), 278–305.
- Kundu, D. & Banerjee, A. 2018 Migration, caste and marginalised sections. *Economic & Political Weekly* 53 (2), 62–70.
- López-Moctezuma, G., Wantchekon, L., Rubenson, D., Fujiwara, T. & PeLero, C. 2022 Policy deliberation and voter persuasion: Experimental evidence from an election in the Philippines. *American Journal of Political Science* 66 (1), 59–74.
- Madheswaran, S. & Attewell, P. 2007 Caste discrimination in the Indian urban labour market: Evidence from the National Sample Survey. *Economic and Political Weekly* 42 (41), 4146–4153.
- Miklian, J. & Sahoo, N. 2016 Supporting a more inclusive and responsive urban India. *Prio Policy Brief* 1–4.
- Mishra, P., Veerapandian, K. & Choudhary, P. 2021 Impact of socio-economic inequity in access to maternal health benefits in India: Evidence from Janani Suraksha Yojana using NFHS data. *PLoS One* 16 (3), 1–17.
- Mojumdar, S. K. 2018 Determinants of health service utilization by urban households in India. *Journal of Health Management* 20 (2), 105–121.
- Nguyen, P., Scott, S., Headey, D., Singh, N., Tran, L., Menon, P. & Ruel, M. 2021 The double burden of malnutrition in India: Trends and inequalities (2006–2016). *PLoS One* 2, 16.
- Nolan, L. 2015 Slum definitions in urban India: Implications for the measurement of health inequalities. *Population and Development Review* 41 (1), 59–84.
- Oaxaca, R. 1973 Male-female wage differentials in urban labor markets. *International Economic Review* 14 (3), 693–709.

- Post, J., Broekema, J. & Obirih-Opareh, N. 2003 Trial and error in privatisation: Experiences in urban solid waste collection in Accra (Ghana) and Hyderabad (India). *Urban Studies* **40** (4), 835–852.
- Rao, N. & Min, J. 2018 Decent living standards: Material prerequisites for human wellbeing. *Social Indicators Research* **138** (1), 225–244.
- Schelling, T. 1971 Dynamic models of segregation. *Journal of Mathematical Sociology* **1** (2), 143–186.
- Sen, B. 2014 Using the Oaxaca–Blinder decomposition as an empirical tool to analyze racial disparities in obesity. *Obesity* **22** (7), 1750–1755.
- Sharma, M. & Abhay, R. 2022 Urban growth and quality of life: Inter-district and intra-district analysis of housing in NCT-Delhi, 2001–2011–2020. *GeoJournal* **87** (4), 797–819.
- Sidhwani, P. 2015 Spatial inequalities in big Indian cities. *Economic and Political Weekly* **50** (22), 55–62.
- Singh, G., Vithayathil, T. & Pradhan, K. C. 2019 Recasting inequality: Residential segregation by caste over time in urban India. *Environment & Urbanization* **31** (2), 615–634.
- Stewart, F. 2002 Horizontal inequalities: A neglected dimension of development. *CRISE Working Paper* **101**, 1–38.
- Stewart, F. 2017 *Human Development Reports*. Available from: <https://hdr.undp.org/content/can-horizontal-inequalities-be-overcome>. (accessed 10 January 2024)
- Summan, A., Nandi, A., Schueller, E. & Laxminarayan, R. 2022 Public health facility quality and child immunization outcomes in rural India: A decomposition analysis. *Vaccine* **40** (16), 2388–2398.
- Susewind, R. 2017 Muslims in Indian cities: Degrees of segregation and the elusive ghetto. *Environment and Planning A: Economy and Space* **49** (6), 1286–1307.
- Szumilas, M. 2010 Explaining odds ratios. *J Can Acad Child Adolesc Psychiatry*. **19** (3), 227–229.
- Thorat, S. & Neuman, K. 2012 *Blocked by Caste: Economic Discrimination in Modern India*. Oxford University Press, Oxford.
- Thorat, S., Banerjee, A., Mishra, V. K. & Rizvi, F. 2015 Urban rental housing market: Caste and religion matters in access. *Economic and Political Weekly* **50** (26), 47–53.
- Tiebout, C. 1956 A pure theory of local expenditures. *Journal of Political Economy* **64** (5), 416–424.
- United Nations n.d. *Universal Declaration of Human Rights*. United Nations. Available from: <https://www.un.org/en/about-us/universal-declaration-of-human-rights#:~:text=Article%20,property%2C%20birth%20or%20other%20status> (accessed 10 January 2024).
- Walton, M. 2018 *Energy has a Role to Play in Achieving Universal Access to Clean Water and Sanitation*. International Energy Agency, Paris.
- Wantchekon, L. 2017 Policy deliberation and voter persuasion: Estimating intrinsic causal effects of town Hall meetings. *Journal of Development Effectiveness* **9** (3), 295–304.

First received 9 June 2023; accepted in revised form 6 February 2024. Available online 17 February 2024