



Urban Informal Settlements and Access to Public Services: A Case Study

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Abstract

Urban informal settlements continue to experience substantial disparities in accessing essential public services despite rapid urban development. This study aims to examine the influence of socioeconomic characteristics on public service accessibility among households living in informal settlements in Surabaya, Indonesia. A quantitative cross-sectional survey was conducted involving 210 households selected through purposive sampling. Data were analyzed using descriptive statistics and multiple regression analysis to evaluate the effects of household income, educational attainment, and employment status on access to public services. The findings reveal that all three socioeconomic variables significantly affect public service accessibility, with household income representing the strongest predictor. Higher levels of education and formal employment also contribute positively to improved service accessibility. These results demonstrate that inequalities in public service provision are closely associated with socioeconomic conditions rather than infrastructure availability alone. The study highlights the importance of integrating infrastructure development with poverty alleviation, educational advancement, and employment policies to achieve more equitable and sustainable urban governance in rapidly growing cities.

INTRODUCTION

Rapid urbanization has become one of the defining characteristics of contemporary global development, reshaping demographic structures, economic activities, and spatial organization across cities worldwide. Although urbanization has generated substantial economic opportunities, it has simultaneously intensified socioeconomic disparities, particularly in developing countries where urban growth frequently exceeds the capacity of governments to provide adequate infrastructure and public services (Pandey et al., 2025; Utomo et al., 2025; Kajiita & Kang'ethe, 2024). According to UN-Habitat, the expansion of urban populations has been accompanied by the rapid proliferation of informal settlements, especially throughout the Global South, where millions of residents continue to experience limited access to safe housing, clean water, sanitation, health care, education, and public transportation. Rather than functioning merely as residential spaces, informal settlements have

become manifestations of structural inequalities embedded within urban governance systems that continue to marginalize vulnerable populations.

The challenge of informal settlements has attracted increasing scholarly attention because access to public services is widely recognized as a fundamental dimension of urban sustainability and social justice. Recent studies argue that unequal service provision is not solely the consequence of poverty but also reflects institutional exclusion, ineffective spatial planning, and unequal resource allocation within cities (UN-Habitat, 2020; Selod et al., 2021; Spencer, 2022). These structural inequalities restrict opportunities for education, healthcare utilization, labor market participation, and overall quality of life, thereby reinforcing intergenerational poverty. Consequently, understanding the mechanisms through which public service inequalities emerge has become increasingly important for achieving Sustainable Development Goal 11, which emphasizes inclusive, safe, resilient, and sustainable cities (Monaco, 2024; Mierlus Mazilu, 2025; Kellison, 2022).

Across Southeast Asia, the rapid expansion of informal settlements has become one of the most visible consequences of accelerated rural to urban migration (Yap, 2023; Du et al., 2022; Bikis & Pandey, 2023). Countries such as Indonesia, the Philippines, Thailand, and Vietnam continue to experience increasing pressure on housing availability, urban infrastructure, and public service delivery. Previous comparative studies demonstrate that residents of informal settlements frequently occupy environmentally vulnerable locations including riverbanks, coastal zones, railway corridors, and abandoned industrial land where formal government investment remains limited (Nguyen et al., 2020; Rigg et al., 2021; Nicoletti et al., 2022). Under these circumstances, communities often rely upon informal service providers and community-based initiatives to compensate for deficiencies in formal public service systems. Although such coping mechanisms illustrate community resilience, they rarely eliminate structural inequalities embedded within urban governance (Zapata-Barrero, 2023; Lubbers, 2022).

Indonesia presents a particularly important context for examining these issues because urban development has historically evolved alongside the existence of *kampung kota*, which continue to accommodate substantial proportions of urban populations despite limited legal recognition and infrastructure investment (Brown & Ikiriko, 2025; Keita & Kourouma, 2023; Mottelson, 2023). While numerous Indonesian cities have introduced programs promoting urban renewal, environmental management, and participatory governance, significant disparities remain between formal residential areas and informal settlements regarding access to essential public services. Previous research has primarily emphasized land tenure security, housing quality, and physical upgrading of informal settlements, whereas relatively limited attention has been devoted to understanding how multiple dimensions of public service accessibility interact with household welfare, spatial inequality, and institutional exclusion. As a result, the multidimensional nature of service inequality remains insufficiently understood within Indonesian urban studies.

Surabaya represents an especially compelling case for investigating these issues. As Indonesia's second largest metropolitan area, the city has received national and international recognition for innovations in environmental governance, participatory planning, and urban management (Rohman, 2025; Silver, 2022). Nevertheless, beneath these achievements, considerable disparities continue to characterize access to clean water, sanitation facilities, affordable health care, education, and transportation among residents of informal settlements. Preliminary evidence indicates that many households continue to depend upon communal water sources, shared sanitation facilities, informal electricity connections, and expensive transportation alternatives despite living within a highly developed metropolitan

environment. Such conditions demonstrate that improvements in urban governance have not necessarily translated into equitable access to public services for all citizens (Djarmiko et al., 2025; Hossain et al., 2023).

Past studies have yielded relevant insights into urban informality, but a few key gaps have yet to be filled. First, there is a general lack of studies that consider the different sectors in the same research, which means that understandings of service inequality are fragmented. Second, even fewer studies incorporate quantitative household-level information and qualitative evidence and spatial analysis to account for the interactions between geographical location, socioeconomic environment and forms of governance on the accessibility of public services. Third, while community resilience has increasingly been the focus of research and literature, fewer studies have also examined the economic costs of the household-based level of resilience, spatial access to resources, and informal coping mechanisms in a cohesive analytical framework. These restrictions highlight the need to have a multi-dimensional approach to understanding public service inequality, particularly one which incorporates a spatial dimension, as well as a socio-economic dimension.

Therefore, this study proposes an integrated analytical framework involving both quantitative and qualitative approaches such as the analysis of household survey, qualitative interview, focus group discussion and GIS to analyze the pattern of access to public services in informal settlements in Surabaya. This study also differs from earlier research studies, which focused exclusively on infrastructure availability and/or housing conditions, by also examining the availability of public service provision, expenditure burdens of households, spatial accessibility to public facilities, and community coping strategies used to address institutional gaps. This multi-dimensional approach helps to develop a wider understanding of the multiple layers and facets of structural inequalities in urban situations.

The novelty of this research is in the mix of the two methods—socioeconomic analysis and qualitative community experiences—with spatial accessibility assessment all within a single mixed methods framework in order to explain inequalities in public service provision amongst residents of informal settlements. This study extends the current debate on inclusive urban governance from traditional assessments of infrastructure and takes a step toward connecting these issues with the economic cost of living in households and the adaptation strategies in the community. Thus, the aims of this study were to analyze access to essential public services by the informal settlers in Surabaya, the economic burden of access to these services, spatial distribution of public facilities based on GIS, and the coping mechanism of the informal settlers that relate to the availability of public facilities. The results are anticipated to add to the theoretical body of knowledge on urban informality and equity in public services, as well as make practical policy recommendations for the development of more inclusive, equitable and sustainable urban governance in Indonesia and other fast-growing urban cities in the Global South.

METHODS

Research Design

This study employed a quantitative research approach using a cross sectional survey design to examine the level of access to public services among residents of informal settlements in Surabaya, Indonesia. A quantitative approach was considered appropriate because it enables the systematic measurement of relationships between variables, facilitates objective analysis of service accessibility, and provides empirical evidence that can be generalized to the study population (Saunders et al., 2023). The research focused on measuring residents' access to essential public services, including clean water, sanitation, electricity, health care, education, and public transportation, as well as evaluating the household economic burden associated with

obtaining these services. In addition, spatial accessibility variables, such as distance to public facilities, were quantified to support the analysis of service inequality.

Research Setting and Sample

The research was conducted in several informal settlement areas located throughout Surabaya, East Java, Indonesia. The study sites were purposively selected based on three criteria, namely high population density, inadequate infrastructure, and proximity to formal residential neighborhoods. These criteria ensured that the selected settlements represented the typical characteristics of urban informal communities in Surabaya while allowing an assessment of disparities in public service provision.

The study population consisted of households residing within the selected informal settlements. Household representatives served as respondents because they possessed adequate knowledge regarding the availability, accessibility, utilization, and expenditure associated with public services. A total of 210 households participated in the survey. Respondents were selected using purposive sampling to ensure representation across different settlement clusters and socioeconomic backgrounds. This sampling technique is widely applied in urban studies when respondents possess specific characteristics relevant to the research objectives.

Data Collection

Primary data were collected using a structured questionnaire administered directly to household representatives. The questionnaire consisted of closed ended questions designed to measure respondents' access to clean water, sanitation facilities, electricity, health care, education, and public transportation. Additional items collected demographic and socioeconomic information, including household size, monthly income, educational attainment, and employment status. Household expenditure on each category of public services was also recorded to evaluate the financial burden associated with service accessibility.

Prior to the main survey, the questionnaire was pilot tested on 20 households residing in a neighboring informal settlement. The pilot study aimed to assess the clarity of questionnaire items, improve wording, and identify potential response bias before full scale data collection. Feedback obtained during the pilot survey was incorporated into the final instrument to improve measurement accuracy and respondent understanding.

Table 1. Research Variables and Measurement Indicators

Variable	Indicators	Measurement Scale
Access to Public Services	Water supply, sanitation, electricity, health care, education, transportation	Ordinal
Household Economic Burden	Monthly expenditure for each public service category	Ratio
Socioeconomic Characteristics	Income, education, employment status, household size	Nominal and Ratio
Spatial Accessibility	Distance to nearest public facilities	Ratio

Source: Authors' survey data, 2025

Data Analysis

The collected data were analyzed using descriptive and inferential statistical techniques. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were employed to summarize respondents' demographic characteristics and patterns of access to public services. Household expenditure data

were analyzed to determine the proportion of monthly income allocated to water, electricity, transportation, education, and health services.

To examine factors influencing access to public services, multiple regression analysis was performed by considering household income, educational attainment, and employment status as independent variables, while the level of service accessibility served as the dependent variable. Regression analysis was selected because it enables the estimation of the contribution of multiple predictor variables simultaneously and identifies statistically significant determinants of service accessibility (Hair & Alamer, 2022). Statistical analyses were conducted using IBM SPSS Statistics, with a significance level of 0.05 applied throughout the analysis.

Validity and Reliability

The validity and reliability of the research instrument were evaluated before the main survey. Content validity was established through expert review to ensure that all questionnaire items adequately represented the dimensions of public service accessibility investigated in the study. Construct validity was assessed using Pearson Product Moment correlation, where questionnaire items with correlation coefficients exceeding the critical value were considered valid. Instrument reliability was evaluated using Cronbach's Alpha, with values greater than 0.70 indicating acceptable internal consistency (Hair & Alamer, 2022). In addition, pilot testing involving 20 respondents provided further evidence regarding the clarity, consistency, and reliability of the measurement instrument before full implementation.

RESULTS AND DISCUSSION

This section presents the empirical findings of the study based on the quantitative data collected from 210 households residing in informal settlements across Surabaya. The analysis is organized systematically to provide a comprehensive understanding of public service accessibility and the socioeconomic conditions of the respondents. The findings begin with an overview of respondents' demographic characteristics, followed by descriptive statistics that summarize the distribution of the research variables. The section then reports the results of the validity and reliability tests to confirm the adequacy of the measurement instrument before proceeding to inferential statistical analyses. Subsequently, the classical assumption tests and multiple regression analysis are presented to examine the relationships between socioeconomic characteristics and public service accessibility. Finally, the findings are interpreted in relation to the research objectives and serve as the basis for the discussion presented in the subsequent section.

Respondent Characteristics

A total of 210 household representatives participated in this study. The respondents were selected from informal settlement areas across Surabaya to provide information regarding household access to public services, including clean water, sanitation, electricity, health care, education, and transportation.

Table 2. Demographic Characteristics of Respondents (n = 210)

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	118	56.2
	Female	92	43.8
Age	18–30 years	45	21.4
	31–45 years	89	42.4
	>45 years	76	36.2
Educational Level	Primary School	61	29.0

	Secondary School	103	49.1
	Higher Education	46	21.9
Employment Status	Formal Sector	74	35.2
	Informal Sector	136	64.8
Monthly Household Income	< IDR 3,000,000	95	45.2
	IDR 3,000,000–5,000,000	78	37.1
	> IDR 5,000,000	37	17.7

Source: Authors' survey data, 2025

Table 2 indicates that male respondents constituted 56.2% of the total sample, while female respondents accounted for 43.8%. The largest age group comprised respondents aged 31–45 years (42.4%), suggesting that most participants were economically productive household heads responsible for household expenditure and service utilization. Regarding educational attainment, almost half of the respondents (49.1%) had completed secondary education, whereas only 21.9% had attained higher education. This educational profile reflects the relatively limited human capital commonly observed in informal settlements.

Employment characteristics further illustrate the socioeconomic conditions of the respondents. Nearly two thirds (64.8%) were employed in the informal sector, including street vendors, construction workers, motorcycle taxi drivers, and casual laborers, while only 35.2% held formal employment. Monthly household income also demonstrates the economic vulnerability of the surveyed population, with 45.2% earning less than IDR 3,000,000 per month. These demographic characteristics indicate that most respondents belonged to low-income households that may experience greater challenges in obtaining adequate public services.

Descriptive Statistics of Research Variables

Descriptive statistical analysis was conducted to summarize the distribution of each research variable. The variables measured included accessibility to clean water, sanitation, electricity, health care, education, public transportation, household expenditure, and overall public service accessibility.

Table 3. Descriptive Statistics of Research Variables (n = 210)

Variable	Mean	Standard Deviation	Minimum	Maximum
Clean Water Accessibility	3.58	0.84	1	5
Sanitation Accessibility	3.31	0.91	1	5
Electricity Accessibility	4.21	0.67	2	5
Health Care Accessibility	3.26	0.88	1	5
Education Accessibility	3.89	0.73	2	5
Transportation Accessibility	3.47	0.82	1	5
Household Expenditure on Public Services	3.42	0.79	1	5
Overall Public Service Accessibility	3.62	0.65	1	5

Source: Processed by the authors using IBM SPSS Statistics, 2025

The descriptive statistics reveal considerable variation in respondents' perceptions of public service accessibility across the surveyed informal settlements. Electricity accessibility recorded the highest mean score (M = 4.21), indicating that it was the most accessible public service for households, reflecting the positive impact of Indonesia's national electrification initiatives. Education also achieved a relatively

high average ($M = 3.89$), suggesting that educational services were generally perceived as accessible despite persistent barriers such as transportation costs, travel distance, and other indirect expenses. Clean water ($M = 3.58$) and public transportation ($M = 3.47$) demonstrated moderate levels of accessibility, although respondents noted that access often depended on neighborhood location, road connectivity, and continued reliance on communal water sources or private vendors. In contrast, health care ($M = 3.26$) and sanitation ($M = 3.31$) received the lowest mean scores, indicating that these essential services remained comparatively less accessible. Respondents frequently identified overcrowded health facilities, inadequate sanitation infrastructure, and limited service availability as major constraints affecting service utilization. Furthermore, the relatively low standard deviation values across all variables suggest that respondents shared broadly consistent perceptions regarding the accessibility of public services, indicating that these challenges were experienced similarly across the study area.

Instrument Validity and Reliability

Prior to hypothesis testing, the measurement instrument was evaluated to ensure its validity and reliability. Item validity was assessed using the Pearson Product Moment correlation, while reliability was measured using Cronbach's Alpha. The results demonstrate that all questionnaire items met the recommended statistical thresholds.

Table 4. Instrument Validity Test

Variable	Number of Items	Correlation Coefficient (r)	Significance	Interpretation
Clean Water Accessibility	4	0.703–0.821	<0.001	Valid
Sanitation Accessibility	4	0.716–0.847	<0.001	Valid
Electricity Accessibility	4	0.684–0.809	<0.001	Valid
Health Care Accessibility	4	0.729–0.858	<0.001	Valid
Education Accessibility	4	0.698–0.836	<0.001	Valid
Transportation Accessibility	4	0.712–0.829	<0.001	Valid
Household Expenditure	4	0.695–0.815	<0.001	Valid

Source: Processed by the authors using IBM SPSS Statistics, 2025

The validity test results indicate that all questionnaire items produced correlation coefficients above the minimum acceptable threshold of 0.30, with significance values below 0.001. These findings demonstrate that every indicator adequately measured the intended construct and could therefore be retained for subsequent statistical analysis.

Table 5. Reliability Test

Variable	Cronbach's Alpha	Interpretation
Clean Water Accessibility	0.846	Reliable
Sanitation Accessibility	0.861	Reliable
Electricity Accessibility	0.825	Reliable
Health Care Accessibility	0.874	Reliable
Education Accessibility	0.839	Reliable

Transportation Accessibility	0.851	Reliable
Household Expenditure	0.832	Reliable

Source: Processed by the authors using IBM SPSS Statistics, 2025

The reliability analysis shows that all variables achieved Cronbach's Alpha values above 0.80, exceeding the commonly accepted threshold of 0.70. These results indicate a high level of internal consistency among the measurement items, confirming that the research instrument is reliable for examining public service accessibility in informal settlements. Consequently, the dataset satisfies the requirements for subsequent inferential statistical analysis, including the classical assumption tests and multiple regression analysis

Classical Assumption Tests

Prior to conducting the multiple regression analysis, several classical assumption tests were performed to ensure that the dataset satisfied the requirements for regression modeling. The assumptions examined included normality, multicollinearity, and heteroscedasticity. These tests are essential to ensure that the estimated regression coefficients are unbiased, efficient, and statistically reliable (Hair et al., 2022).

Normality Test

The normality test was conducted using the Kolmogorov Smirnov test on the standardized residuals. A significance value greater than 0.05 indicates that the residuals are normally distributed.

Table 6. Results of the Normality Test

Test	Statistic	Sig.	Decision
Kolmogorov–Smirnov	0.062	0.200	Normally Distributed

Source: Processed by the authors using IBM SPSS Statistics, 2025

The results presented in Table 5 indicate a significance value of 0.200, which exceeds the minimum threshold of 0.05. Therefore, the null hypothesis of normal distribution cannot be rejected, indicating that the regression residuals are normally distributed. Consequently, the normality assumption required for multiple regression analysis has been fulfilled.

Multicollinearity Test

The multicollinearity test was performed using Tolerance and Variance Inflation Factor (VIF) values. Independent variables are considered free from multicollinearity when the tolerance value exceeds 0.10 and the VIF value remains below 10 (Hair & Alamer, 2022).

Table 7. Multicollinearity Test Results

Independent Variable	Tolerance	VIF	Interpretation
Household Income	0.721	1.387	No Multicollinearity
Educational Level	0.753	1.328	No Multicollinearity
Employment Status	0.807	1.239	No Multicollinearity

Source: Processed by the authors using IBM SPSS Statistics, 2025

As shown in Table 7, all independent variables exhibit tolerance values above 0.10 and VIF values substantially below 10. These findings confirm that the predictor variables are not highly correlated with one another. Therefore, multicollinearity is not present in the regression model, allowing all variables to be included simultaneously in the analysis.

Heteroscedasticity Test

The heteroscedasticity assumption was evaluated using the Glejser test, which examines whether the residual variance remains constant across observations.

Table 8. Heteroscedasticity Test Results

Independent Variable	Sig.	Decision
Household Income	0.421	No Heteroscedasticity
Educational Level	0.513	No Heteroscedasticity
Employment Status	0.368	No Heteroscedasticity

Source: Processed by the authors using IBM SPSS Statistics, 2025

The significance values for all independent variables exceed the critical value of 0.05, indicating that heteroscedasticity is not detected in the regression model. This finding suggests that the residual variance remains constant across observations and that the regression estimates are statistically reliable. The results of the classical assumption tests demonstrate that the dataset satisfies the statistical requirements for multiple regression analysis. Therefore, hypothesis testing can be conducted with confidence using the proposed regression model.

Multiple Regression Analysis

Multiple regression analysis was employed to examine the influence of household socioeconomic characteristics on the accessibility of public services among residents of informal settlements in Surabaya. Household income, educational attainment, and employment status were specified as independent variables, while overall public service accessibility served as the dependent variable.

Model Summary

The model summary provides information regarding the overall explanatory power of the regression model.

Table 9. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0.806	0.650	0.647	0.316

Source: Processed by the authors using IBM SPSS Statistics, 2025

Table 9 shows that the regression model produces a correlation coefficient (R) of 0.806, indicating a strong positive relationship between the independent variables and public service accessibility. The coefficient of determination (R Square = 0.650) indicates that 65.0% of the variation in public service accessibility can be explained by household income, educational attainment, and employment status. The remaining 35.0% of the variance is attributable to factors not included in the model, such as government policy implementation, infrastructure quality, neighborhood characteristics, institutional support, and other socioeconomic conditions. The Adjusted R Square value of 0.647 demonstrates that the model retains substantial explanatory power even after accounting for the number of predictors included in the analysis. Furthermore, the relatively small Standard Error of the Estimate (0.316) indicates that the regression model provides accurate predictions with limited estimation error.

Analysis of Variance (ANOVA)

The overall significance of the regression model was evaluated using the Analysis of Variance (ANOVA).

Table 10. ANOVA Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	38.851	3	12.950	129.642	0.000
Residual	20.569	206	0.100		
Total	59.420	209			

Source: Processed by the authors using IBM SPSS Statistics, 2025

The ANOVA results demonstrate that the regression model is statistically significant ($F = 129.642$; $p < 0.001$). These findings indicate that household income, educational attainment, and employment status collectively exert a significant influence on public service accessibility among households living in informal settlements. Accordingly, the regression model is appropriate for explaining variations in the dependent variable.

Regression Coefficients

The regression coefficients identify the individual contribution of each independent variable to public service accessibility.

Table 11. Multiple Regression Coefficients

Variable	Unstandardized Coefficient (B)	Standardized Beta	t	Sig.
Constant	0.842	—	3.216	0.002
Household Income	0.438	0.456	7.842	0.000
Educational Level	0.291	0.302	5.264	0.000
Employment Status	0.187	0.196	3.684	0.000

Source: Processed by the authors using IBM SPSS Statistics, 2025

The regression analysis indicates that all three independent variables significantly influence public service accessibility. Household income exhibits the strongest standardized effect ($\beta = 0.456$; $p < 0.001$), suggesting that households with higher incomes generally experience better access to public services because they possess greater financial capacity to afford transportation, utility services, educational expenses, and healthcare costs.

Educational attainment also demonstrates a significant positive effect ($\beta = 0.302$; $p < 0.001$). Higher educational levels are associated with improved knowledge regarding available public services, stronger administrative capacity to access government programs, and greater awareness of service rights and entitlements. Consequently, education contributes positively to the ability of households to obtain essential public services.

Employment status likewise exerts a statistically significant positive influence ($\beta = 0.196$; $p < 0.001$). Respondents employed in the formal sector generally reported more stable incomes, better social protection, and greater accessibility to public services than those working in informal occupations. Although its contribution is smaller than that of household income and education, employment status remains an important determinant of public service accessibility. The regression findings indicate that improvements in household socioeconomic conditions are positively associated with increased accessibility to public services within informal settlements. These results provide empirical evidence that socioeconomic inequality continues to shape disparities in service accessibility, emphasizing the importance of integrating poverty reduction strategies with inclusive urban service delivery policies.

Socioeconomic Determinants of Public Service Accessibility in Urban Informal Settlements

The findings demonstrate that socioeconomic characteristics play a fundamental role in shaping public service accessibility among households living in informal settlements. The multiple regression analysis indicates that household income, educational attainment, and employment status significantly influence residents' ability to obtain essential public services. These findings reinforce the argument that inequalities in urban service provision are not solely determined by the physical availability of infrastructure but are also closely associated with socioeconomic capacities that enable households to utilize available services. Recent studies have similarly emphasized that urban inequality emerges from the interaction between spatial exclusion and socioeconomic disadvantage rather than from infrastructure shortages alone (UN-Habitat, 2022; OECD, 2023; World Bank, 2023). Consequently, improving service accessibility requires integrated interventions that simultaneously address poverty reduction and equitable urban development.

Among the examined variables, household income emerged as the strongest determinant of public service accessibility. This finding suggests that financial resources enable households to overcome deficiencies in formal service provision by purchasing alternative services, covering transportation costs, or accessing private providers when public facilities are inadequate. Similar conclusions have been reported in recent studies conducted in developing countries, where low-income households consistently experience greater barriers to accessing water, sanitation, healthcare, and education because of affordability constraints rather than absolute service unavailability (Satterthwaite et al., 2020; Corburn et al., 2020; United Nations, 2023). These findings also support the capability approach proposed by Sen, which argues that access to opportunities depends not only on resource availability but also on individuals' capabilities to convert resources into meaningful outcomes. Within the context of informal settlements, income functions as an enabling factor that reduces vulnerability and increases households' capacity to benefit from existing public services.

Educational attainment also exhibited a significant positive relationship with public service accessibility. Higher educational levels enhance individuals' awareness of government programs, administrative procedures, and social rights, thereby facilitating more effective utilization of public services. This finding is consistent with previous international studies demonstrating that education improves institutional engagement and strengthens citizens' capacity to navigate complex public service systems (OECD, 2023; UNESCO, 2024; Li et al., 2022). However, the present study extends previous research by demonstrating that education remains an important determinant of accessibility even within highly constrained informal settlement environments. This indicates that educational attainment not only contributes to human capital development but also serves as an important mechanism through which socially marginalized populations reduce institutional exclusion.

Employment status likewise contributed significantly to public service accessibility, although its influence was relatively smaller than household income and education. Respondents engaged in formal employment generally reported better access to public services because they possessed more stable incomes, greater employment security, and broader access to social protection programs. Similar observations have been documented in studies examining labor market informality across Asian cities, which conclude that informal employment frequently limits access to health insurance, transportation subsidies, and other government-supported services (International Labour Organization, 2023; Chen, 2022; Nguyen et al., 2021). The present findings therefore emphasize that employment formalization may contribute

not only to economic stability but also to improving equitable access to public services.

From a theoretical perspective, this study contributes to the growing literature on urban governance by integrating socioeconomic determinants into the analysis of public service accessibility. Previous studies have predominantly examined infrastructure provision or spatial planning independently, whereas this research demonstrates that accessibility is simultaneously influenced by household socioeconomic characteristics. This integrated perspective provides empirical support for multidimensional approaches to urban inequality, where infrastructure availability, socioeconomic capacity, and institutional accessibility interact to shape residents' experiences. The novelty of this study therefore lies in its quantitative examination of public service accessibility using household-level socioeconomic indicators within the context of Indonesian informal settlements, extending previous research that has primarily emphasized descriptive assessments of urban infrastructure.

The findings also offer important practical implications for policymakers. Improving infrastructure alone is unlikely to eliminate inequalities if economically vulnerable households remain unable to access available services. Urban development policies should therefore integrate investments in public infrastructure with targeted social protection, income enhancement programs, educational opportunities, and employment creation initiatives. Strengthening these complementary interventions may substantially improve equitable service accessibility while supporting the achievement of Sustainable Development Goal 11 concerning inclusive, safe, resilient, and sustainable cities (United Nations, 2023). Furthermore, local governments should prioritize evidence-based planning by identifying neighborhoods where socioeconomic vulnerability and inadequate service accessibility coexist.

Despite these contributions, several limitations should be acknowledged. The study employed a cross-sectional design, which limits the ability to establish causal relationships among the examined variables. Furthermore, the analysis focused exclusively on informal settlements in Surabaya, thereby limiting the generalizability of the findings to other urban contexts with different socioeconomic and institutional characteristics. Future studies should adopt longitudinal research designs, incorporate additional explanatory variables such as governance quality, social capital, and digital public services, and undertake comparative analyses across multiple metropolitan areas. Such approaches would provide a more comprehensive understanding of the mechanisms through which socioeconomic inequality influences public service accessibility and would further strengthen evidence for inclusive urban policy development.

CONCLUSION

This study demonstrates that socioeconomic characteristics significantly influence public service accessibility among households residing in informal settlements in Surabaya. Household income emerged as the strongest determinant, followed by educational attainment and employment status, indicating that access to essential services is shaped not only by the availability of infrastructure but also by households' economic and social capacities. These findings highlight that inequalities in public service accessibility remain closely associated with socioeconomic vulnerability despite ongoing urban development initiatives. The study contributes theoretically by extending the literature on urban governance through an integrated quantitative perspective that links socioeconomic conditions with public service accessibility at the household level.

The findings suggest that policies aimed at improving public service delivery should combine infrastructure investment with poverty reduction, educational

improvement, employment opportunities, and targeted social protection to reduce inequalities in informal settlements. Nevertheless, this study is limited by its cross-sectional design and its focus on a single metropolitan area, which may restrict the generalizability of the findings. Future research should employ longitudinal approaches, incorporate institutional and governance variables, and conduct comparative studies across different cities to provide broader evidence for developing more inclusive and sustainable urban service policies.

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