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Homelessness and Socioeconomic Conditions

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Abstract

The COVID-19 pandemic has led to an increase in homelessness in numerous countries, including Thailand. The economic downturn, particularly the rise in unemployment, largely caused this increase. This study examines the factors influencing homelessness by estimating an equation identifying the determinants of homelessness rates. The independent variables considered in the analysis include the unemployment rate, minimum wage, average household expenses, land appraisal price, average years of schooling, mean O-NET test scores, the proportion of the elderly population, the proportion of patients with schizophrenia, the proportion of people with disabilities, the proportion of COVID-19 patients, the proportion of patients with alcoholism, urbanization rate, maximum temperature, and precipitation levels. The study utilizes cross-sectional data from various provinces in Thailand for the year 2022. The regression analysis, conducted using the ordinary least squares (OLS) method, reveals that increases in average household expenses, the proportion of the elderly population, and the proportion of COVID-19 patients are positively associated with higher homelessness rates. Conversely, a rise in the average years of schooling, indicative of a higher overall education level, is correlated with a decline in homelessness rates. The research results suggest that policymakers should implement plans for enhanced support systems for individuals facing challenges during crises such as infectious disease outbreaks.

Keywords: Homeless, COVID-19 pandemic, Economic slowdown, Mental disorder patients, Housing prices

Introduction

Homelessness is a widespread social issue found across all nations and communities, particularly in cities and metropolitan regions. Homelessness encompasses a multitude of issues, including 1) economic difficulties like poverty, high cost of living in urban areas, and income inequality; 2) social issues including family dynamics, exploitation of the underprivileged, and community support; 3) public health concerns such as healthcare for low-income individuals with chronic illness, psychiatric care, and addiction treatment; and 4) problems with the welfare system, including budget and personnel deficiencies, that hinder government agencies' ability to assist those in need, e.g., disaster victims. The multitude of challenges described previously renders it challenging to resolve the issue of homelessness. Therefore, homelessness issues persist in numerous societies around the world. In addition, the COVID-19 outbreak since the end of 2019 has significantly affected both the economic and social circumstances. It has caused the rise of homeless persons in many countries. For example, the United States was a country that persisted in addressing the issue of homelessness, and the data indicated a general decline in the number of homeless individuals since 2007. However, the number of homeless individuals in the United States notably increased in 2020 during the COVID-19 pandemic. In that year, researchers identified 580,466 homeless individuals and projected that the number would rise to approximately 653,104 by 2023 (Statista, 2025).

A similar scenario was identified in Thailand. According to a Ministry of Social Development and Human Security and related agencies' survey, the results show approximately 1,271 homeless people in Bangkok

in 2023. While only 1,029 homeless people were found in 2019 (Welfare Protection and Quality of Life Promotion Division, Department of Social Development and Welfare, Ministry of Social Development and Human Security, 2023). The assumption is that the number of homeless individuals has escalated due to the COVID-19 pandemic. In addition to Bangkok, other provinces in Thailand also have people experiencing homelessness. The provinces with the highest number of homeless people after Bangkok are Chonburi, Chiang Mai, Khon Kaen, Kanchanaburi, and Nakhon Ratchasima, respectively. (See Table 1)

Table 1 Top 10 provinces with the highest number of homeless people in 2023

No.	Province	Homeless people* (persons)
1	Bangkok	1,271
2	Chonburi	126
3	Chiang Mai	118
4	Khon Kaen	73
5	Kanchanaburi	62
6	Nakhon Ratchasima	59
7	Songkhla	46
8	Rayong	38
9	Pathum Thani	34
10	Lop Buri	33

Note: * The homeless people count includes: 1) homeless individuals, destitute persons, or vagrants residing in public spaces or shelters provided by the government or civil society organizations, and 2) individuals who sleep and live in public spaces or non-residential public buildings. The count follows a one-night counting method, conducted on Tuesday, May 23, 2023, from 7:00 PM to 12:00 AM.

Source: Welfare Protection and Quality of Life Promotion Division, Department of Social Development and Welfare, Ministry of Social Development and Human Security (2023).

To tackle the issue of homelessness, policymakers across different nations focus on grasping the underlying causes of homelessness. Researches about the causes of homelessness, particularly in foreign studies, have categorized into two distinct groups: Firstly, *aggregate-level research*, which involves an examination of factors contributing to an increase in the number of homeless persons, such as the effect of economic factors on homelessness on a state-by-state or country-by-country basis. Secondly, research focused on *the individual level* investigates why people become homeless, such as chronic illnesses that make it difficult for them to work (O'Flaherty, 2019). Economic research is often characterized as the first type of research. Researchers use aggregate data in these studies because the issues often relate to policies designed to address the problems on a nationwide scale. While the second type of research is the research that studies at the individual level, it is often research in other scientific disciplines, e.g., sociological research.

A significant challenge hinders research on homelessness: obtaining accurate statistics on homelessness. Many homeless individuals tend to roam or wander without a fixed abode. They do not have a permanent home address. Consequently, conducting a thorough survey or obtaining an exact count of the number is challenging. Furthermore, individuals experiencing homelessness are either temporarily without a home or are persistently homeless. The definition or meaning of homelessness varies across countries, and research studies have distinct goals. The United States defines homelessness as encompassing three categories: 1) individuals residing on streets or public spaces lacking the attributes of a conventional shelter; 2) people without a fixed abode who spend nights in locations offering temporary shelter; and 3) individuals who temporarily reside in short-term

shelters or homeless support facilities. European countries and Australia define homelessness more broadly, including individuals who reside in unsafe locations due to lack of a fixed abode, such as informal settlement, and those living in unconventional accommodations, such as non-conventional buildings, temporary structure, or vehicles (Feantsa, 2023). Currently, different nations do not track homelessness using uniform data collection methods.

Because researchers cannot compare data on homeless populations across countries, most previous studies focus on individual cases within a single nation. Much of this research relies on data from the United States and Australia, countries in which data is consistently and continually collected. Studies on homelessness have shown that various economic and social factors, such as housing and land prices, the unemployment rate, the number of individuals with psychiatric issues, and government welfare policies, are key contributors to homelessness. (Honig & Filer, 1993; Quigley & Raphael, 2001; Lee et al., 2003; Byrne et al., 2013; Cebula & Alexander, 2020.)

Researchers in Thailand have examined homelessness and related issues through the Programme to Support Knowledge for Promoting Health and Quality of Life for Homeless People, which the Thai Health Promotion Foundation (ThaiHealth) administers. The study investigates various cost analysis methods to address homelessness issues and tracks the impact of these efforts on the lives of newly homeless individuals (Chaiwat, 2018). Researchers developed indicators of vulnerability to homelessness and indicators of readiness to reintegrate into society among homeless individuals (Tangtammaruk, 2018). Two studies examined the reasons and perceptions of individuals who have recently become homeless, defined as those who have experienced homelessness for a relatively brief duration. Research indicates that individuals who decide to become homeless are often motivated by a combination of economic difficulties and family issues. A study conducted under the Project to Survey the Situation of Homeless People and Create Systematic Participation of Network Partners in the Bangkok area, initiated by the Thai Health Promotion Foundation, involved an in-depth demographic survey of homeless individuals in the Bangkok area and surrounding regions (Phithaktanin et al., 2016). Researchers conducted a point-in-time survey to count the number of homeless people in Bangkok at a specific moment. Research has identified several key factors that contribute to homelessness, including job loss, unemployment, conflicts with family members, and domestic violence.

Previous studies on Thailand have relied on individual-level data collected from surveys. The surveys involved counting homeless individuals and conducting interviews with them. There is a lack of aggregate-level research investigating the underlying factors driving the rise in the number of homeless individuals, using data from a broad perspective or an overarching macro-level analysis. This study's objective is to contribute to the body of knowledge on homelessness by conducting aggregate-level research of Thailand, utilizing data at the provincial level. Official statistics on the number of homeless individuals, compiled by the Ministry of Social Development and Human Security and released for 2022, were available by province, facilitating overall-level research.

Theoretical framework

The economic theory that explains the behavior of homeless people comes from O'Flaherty's (1995) article entitled "An Economic Theory of Homelessness and Housing". The model describes the behavior of consumers who choose between two goods, housing and nonhousing goods, concerning the budget constraint regarding the price of residential houses and income. O'Flaherty's (1995) model explains that house prices and an individual's income affect housing availability.

O'Flaherty's (1995) model assumes that there are many consumers. Each person has different income. However, they have the same utility function. Namely, utility depends on consuming two types of goods: housing and nonhousing goods. The income of each person is different, indicating the income distribution. Houses have different qualities which are shown by the variables q. If the quality of the house is equal to zero ($q=0$) the person is homeless. When the value of q has increased, it means having better quality homes and increasing utility. Nonhousing goods may refer to leisure or a composite good, including leisure.

Given that the utility function is $u(q, x)$, when $q \in R^+$ refers to the quality of the house that can be consumed and $x \in R^+$ refers to the nonhousing goods.

The utility function is a strictly increasing function of both q and x and can be twice continuously differentiable with $u_{xx}<0$, $u_{qq}\leq 0$ *and* $u_{qx}\geq 0$.

Let $p(q)$ be a function of house prices, which increases according to the quality of the house or $p(\bullet)$ is a strictly increasing function. Let $p(0) = 0$ which means that a homeless person ($q = 0$) has no price for the house to be paid. However, the house price function does not have to be continuous.

Therefore, the semidirect utility of consumers with quality homes q and have income y is

$$W(q \mid p, y) = u\left(q, y - p(q)\right) \tag{1}$$

and

$$W^*(y \mid p) = \left\{q^* \mid W(q^* \mid p, y) \geq W(q \mid p, y) \ \ for\, all\, q\right\} \tag{2}$$

is the demand quality set for income y.

If the house price function $p(\bullet)$ is linear, semidirect utility for all income y will be a unique maximum value. Moreover, whether or not $p(\bullet)$ is linear, whenever the semidirect utility has a unique maximum, $W^*(y \mid p)$ will be an increasing function of y, which means rich people with higher incomes demand for higher-quality houses.

A person becomes homeless when his demand ~~set~~ for housing is only zero. Given $b(q \mid y)$ is the *homeless bid-rent curve* of a consumer with income y. That is, for each quality of house q, a consumer with income, y will be indifferent between being homeless and having quality q housing at the price $b(q|y)$ or

$$u(0 \mid y) = u\left(q, y - b(q \mid y)\right). \tag{3}$$

Where $u(0 \mid y) = 0$ for all income y and b is continuous and twice differentiable. Homeless bid-rent curves are higher for higher incomes, except when equal to zero. This means that higher-income people will be willing to pay more for a given housing quality rather than homeless. As for homeless people, their bid-rent curve is lower than the price-quality schedule for every positive quality, as shown in Figures 1.

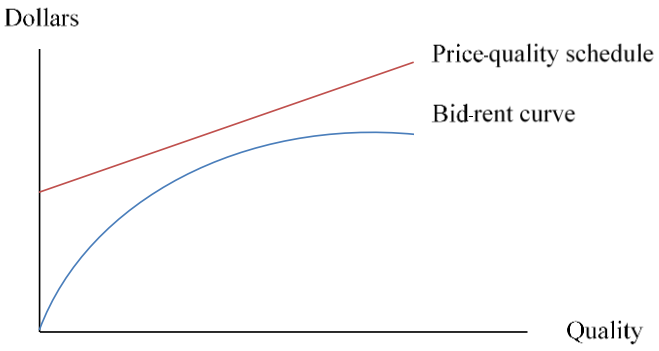

Figure 1 The situation of homeless people, a case of linear house price function
Source: O'Flaherty (1995)

From the above diagram, if we consider individuals with higher incomes, the bid-rent curve will move upwards until it reaches the house price function curve, ~~thereby~~ enabling them to purchase a house. As a result, they will not become homeless. When house prices decrease across all quality levels, this causes the house price function shifts downwards, enabling more people to purchase homes and avoid homelessness.

According to O'Flaherty's (1995) model, income levels and housing prices are key factors contributing to homelessness.

Literature review

Previous studies focusing on the causes of homelessness can be categorized into two main types: first, aggregate-level research, which examines factors influence homelessness at the state or city level and investigates the number of people affected. Secondly, this type of research involves individual-level studies, utilizing interview data from individuals who have experienced homelessness, to examine the factors that lead people to vacate their residences and become homeless. Some of aggregate-level studies found that both economic and social factors influence homelessness. Research studies have predominantly utilized the United States homeless data from the U.S. Census of Population and Housing. The US Department of Housing and Urban Development (HUD). They estimate regression equations where the homelessness rate is the dependent variable. Research indicates that rising housing costs, insufficient affordable housing, and increasing residential rents contribute to homelessness, as noted in studies by Elliott and Krivo (1991), Honig and Filer (1993), Quigley and Raphael (2001), Lee et al. (2003), and Cebula and Alexander (2020). According to Grimes and Chressanthis (1997), implementing a housing rental-price control policy increased the number of homeless individuals in the city. These restrictions frequently impose rents below the equilibrium rate. This forces real estate owners or landowners to alter their assets in search of alternative benefits. The reduction in low-cost housing units is a result of this situation.

Factors such as poverty (Elliott & Krivo, 1991; Lee et al., 2003), employment and unemployment rates (Honig & Filer, 1993; Quigley & Raphael, 2001; Lee et al., 2003), the level of labor market freedom (Cebula & Alexander, 2020), entrepreneurial activity levels (Cebula & Saunoris, 2021), and immigration rates (Lee et al., 2003) also impact homelessness.

The rates of homelessness are influenced by demographic factors and social conditions, such as the percentage of the black/Hispanic population (Lee et al., 2003; Byrne et al., 2013), the proportion of baby boomers (Lee et al., 2003; Byrne et al., 2013), individuals with disabilities (Quigley & Raphael, 2001), educational attainment levels (Cebula & Alexander, 2020), the number of prisoners released (Cebula & Alexander, 2020), mental health expenditures (Byrne et al., 2013), temperature (Quigley & Raphael, 2001; Lee et al., 2003), and precipitation levels (Lee et al., 2003; Byrne et al., 2013).

According to research by Jackson and Kawano in 2015, the implementation of subsidized low-income housing programs in the United States did not decrease neighborhood homelessness. Reducing the number of homeless people is a notable outcome at the county level. The migration of homeless individuals explains the findings of this study. Research conducted by Lucas (2017) indicates that an increase in homeless funding is associated with more sheltered homeless individuals. It does not impact the overall number of unsheltered homeless people.

Research conducted at an aggregate level on homelessness has revealed that various factors influence the rate of homelessness, specifically the cost of housing, the housing vacancy rate, poverty levels, employment/unemployment rates, government funding, rent control laws, population migration rates, labor market conditions, entrepreneurial activity, demographic characteristics such as racial and ethnic composition, age, and education levels, and climate.

Methodology

Model Specification

In order to investigate the effects of economic conditions and other factors on homelessness, the equation of the determinants of homelessness rates is estimated using the ordinary least squares method. The dependent variable is the rate of homelessness, specifically the number of homeless individuals per population. The following section outlines the independent factors influencing the rate of homelessness and their hypothesized relationships with the dependent variable.

1) *Economic factors*

1.1) *Unemployment rate*: A lack of income resulting from unemployment can lead to poverty and difficulties in securing suitable housing. Consequently, homelessness has become more widespread due to rising unemployment rates.

1.2) *Minimum wage*: Minimum wage legislation ensures that employees receive a base income, thereby boosting their standard of living. It is anticipated that this initiative will assist in lowering the rate of homelessness.

1.3) *Average household expenses*: Average household expenses are generally higher in areas with a high cost of living. It is anticipated that homelessness rates will also escalate accordingly.

1.4) *Land appraisal price*: Appraisal prices for land are typically disclosed within a range, encompassing the minimum and maximum value. This study employs the minimum land valuation figure, which signifies the least amount consumers must pay to acquire land. Areas with high land valuations make it difficult for individuals with limited financial resources to purchase property. Consequently, homelessness rates are anticipated to be greater in regions where land and housing costs are substantial.

1.5) *Urbanization rate* (Proportion of population living in the municipality): In a province with high economic development, residents predominantly reside in densely populated urban areas. The increasing competitiveness of life and living conditions has led to decreased societal generosity, with rising costs of living being a contributing factor. It is anticipated that homelessness will rise at a greater urbanization rate.

2) Social factors

2.1) *Year of schooling* (the educational level measured in terms of quantity): With a more educated population, the ability to earn a living and meet basic needs increases, leading to the anticipation that homelessness rates will subsequently decline.

2.2) *Average O-NET test score* (the educational measured in terms of quality): Individuals with higher levels of human capital will be better equipped to secure employment and achieve a satisfactory standard of living. It is anticipated that the rate of homelessness will decline.

2.3) *Proportion of the elderly population* (population aged 60 years and over): As the number of elderly individuals in a household or within a society grows, the rate of dependency is expected to rise accordingly. A person's income from a job may not be sufficient to sustain their entire family. This has led to an increase in the rate of homelessness.

2.4) *Proportion of foreign workers*: Foreign workers frequently face difficulties adapting to their lifestyles and earning a living, and some employers exploit them. Foreign workers, especially unskilled workers, are likely to become homeless due to the country's social welfare system not extending its coverage to them.

2.5) *Number of temples*: In Thai culture, the temple serves as a haven for individuals experiencing hardship. Individuals experiencing poverty, homelessness, or chronic illness may opt to seek assistance from the temple rather than approaching government agencies or residential shelters. The temple serves as a location where individuals can cultivate moral values and kindness within their community. Social interaction involves mutual assistance among individuals. It is expected that the prevalence of neighborhood temples will be correlated with the rate of homelessness.

3) Public health factors

3.1) *Proportion of schizophrenia patients*: Individuals who have schizophrenia with long-standing medical conditions require ongoing medical attention and ongoing treatment. This leads the family to pay for medical bills. Consequently, this may lead to them being abandoned and ending up homeless.

3.2) *Proportion of disabled people*: Being unemployed due to a disability can lead to insufficient income, resulting in an increased risk of homelessness.

3.3) *Proportion of COVID-19 patients*: In regions where COVID-19 spreads extensively, the virus impacts communities and society in terms of public health, family dynamics, and economic operations. These factors may contribute to an escalation in the rate of homelessness.

3.4) *Proportion of patients who have alcohol addiction*: Individuals suffering from alcoholism are at a higher risk of exhibiting violent behavior towards others, often leading to issues within the family. Abusive situations may lead family members, especially children, to leave their homes in order to escape the violence. Moreover, alcohol addiction prevents individuals from maintaining a stable career, resulting in a limited income and rendering them unable to afford-to own a home.

Table 2 Definition, Measurement, and Sources of Data

Variables	Measurement	Units	Sources of Data
Dependent variable			
Homelessness rate	Number of homeless people per population (Number of people who are homeless and requesting the services of the Provincial Homeless Protection Center)	persons per thousand population	Division of Social Development and Human Security Standards, Office of Permanent Secretary, Ministry of Social Development and Human Security
Independent variables			
Unemployment rate	Number of unemployed persons per labor force	percentage	National Statistical Office, Ministry of Digital Economy and Society
Minimum wage		baht per day	Office of the Minimum Wage Commission, Ministry of Labor
Average household expenses	Expenses related to various items or services that are necessary for living	baht per month	National Statistical Office, Ministry of Digital Economy and Society
Land appraisal price	Lower-bound land appraisal price in 2019 (The same rate was employed in 2022.)	Baht per square wa	Treasury Department, Ministry of Finance
Urbanization rate	Proportion of population living in the municipality from registration per total population	percentage	Department of Provincial Administration, Ministry of Interior
Year of schooling	Average years of education of the population aged 15 years and over	year	Office of the Secretariat of the Education Council, Ministry of Education
Average O-NET test score	The average O-NET test score at the high-school level is an average of 5 subjects: 1) Thai language, 2) Social studies, religion, and culture, 3) English language, 4) Mathematics, and 5) Science.	percentage	National Institute of Educational Testing (Public Organization)
Proportion of the elderly population	Number of people aged 60 years and over per total population	percentage	Department of Provincial Administration, Ministry of Interior
Foreign workers	Proportion of remaining foreigners with work permits as of December 31, 2022, per population	persons per thousand population	Department of Employment, Ministry of Labor
Number of temples	Number of temples in 2021 (There is no 2022 data.)	place	National Office of Buddhism
Proportion of schizophrenia patients	Number of schizophrenia patients per population (measured by fiscal year)	persons per thousand population	Strategy and Planning Division, Office of the Permanent Secretary, Ministry of Public Health
Proportion of disabled people	Number of persons with disabilities who have disability identification cards accumulated from 1 November 1994 to 31 December 2022, per population.	persons per thousand population	Department of Promotion and Development of Quality of Life for Persons with Disabilities, Ministry of Social Development and Human Security
Proportion of COVID-19 patients	Cumulative number of COVID-19 patients from 1 April 2021 to 30 September 2022, per population.	percentage	Department of Disease Control, Ministry of Public Health
Proportion of patients suffering from alcohol addiction	Number of patients with alcohol dependence diagnosed and treated within the province, per population (measured by fiscal year)	persons per thousand population	Strategy and Planning Division, Office of the Permanent Secretary, Ministry of Public Health

Variables	Measurement	Units	Sources of Data
Highest temperature	Average maximum temperature throughout the year	Degree Celsius	Hydro Data Science Section, Hydro Informatics Institute
Precipitation	Monthly rainfall averaged for 7 months, January to July 2022.	mm.	Data Innovation and Governance Institute

Source: Author's collection

4) Climatic factors

4.1) *Highest temperature*: Living and sleeping in public has become increasingly challenging in regions with extremely high temperatures. It is anticipated that the number of people without a home, particularly those who sleep in public areas, will decrease.

4.2) *Precipitation*: In regions with high rainfall levels, flooding and epidemics are possible. Public life and sleeping arrangements have become increasingly challenging. The number of homeless individuals, particularly those who sleep in public areas, is anticipated to decline.

Data

The study utilized cross-sectional data from the 77 provinces in Thailand, specifically in 2022 during the COVID-19 pandemic, as this is the sole period for which data on the number of homeless individuals are available. Details on how the variables were measured and the sources of the data are presented in Table 2.

Preliminary statistics of the variables employed in this study are shown in Table 3. It was found that the average rate of homelessness was 7.76 persons per thousand population.

Table 3 Statistical values of variables

Variable	Unit	No. of samples	Mean	SD.	Min	Max
Homeless rate	persons per thousand population	74	7.76	9.01	0	54.68
Unemployment rate	percentage	77	1.34	0.96	0.09	6.85
Minimum wage	Baht per day	77	336.71	7.99	313.00	354.00
Average household expenses	Baht per month	77	20,486	4,393	12,206	37,897
Land appraisal price	Baht per square wa	77	117.92	172.80	10.00	1,000.00
Urbanization rate	percentage	77	27.66	15.52	6.54	100.00
Year of Schooling	year	77	8.79	0.94	6.04	11.43
Average O-NET test score	percentage	77	30.41	2.35	24.95	37.91
Proportion of the elderly population	percentage	77	19.30	3.42	12.42	26.76
Proportion of foreign workers	persons per thousand population	77	41.68	66.25	0.85	466.51
Number of temple	places	77	553.58	460.28	41.00	2,179.00
The proportion of schizophrenia patients	persons per thousand population	77	7.22	2.37	3.76	17.65
Proportion of disabled people	persons per thousand population	77	34.17	9.71	17.16	58.40
Proportion of COVID-19 patients	percentage	77	6.40	4.39	0.90	26.20
Proportion of patients suffering from alcohol addiction	persons per thousand population	77	2.00	3.66	0.09	28.42
Highest temperature	degrees Celsius	65	35.68	0.95	32.67	37.33
Precipitation	mm.	77	137.09	42.85	68.67	276.91

Source: Author's calculation

Regression results

The analysis will utilize data from all provinces in Thailand to estimate the equation of determinants influencing the rate of homelessness. However, data for some variables were unavailable for all provinces. Outliers data of certain variables containing extremely high values reduced the sample size to 62 for actual estimation process. The findings of estimating the equation of determinants of homelessness rates indicate that the following factors contribute to the rate of homelessness: (See Table 4.).

1) *Average household expenses*: Estimating the regression equation revealed that the coefficient of the average household expenditure was 0.001, indicating that a rise in average household expenditure by 1,000 baht per month would correspond to a 1 person per thousand population increase in homelessness rates. An increase in the average household expenditure signals a higher cost of living. Consequently, many individuals are unable to generate sufficient income to support themselves. This contributes to a rise in the rate of homelessness. In essence, provinces with a high cost of living are likely to have homeless individuals.

2) *Year of schooling*: For each additional year of schooling, a decline of 7.516 individuals per thousand population in the rate of homelessness is expected. Education is vital in improving work-related skills and fostering essential human qualities. Education enables populations to earn a living and support their families by providing them the means to live a fulfilling life. Education plays a key role in lowering the incidence of homelessness.

3) *Proportion of elderly people*: According to the estimation results, a 1 percent increase in the proportion of elderly individuals, defined as those aged 60 years and over, leads to a rise of 1.520 individuals per thousand population in the rate of homelessness. Many elderly individuals are not employed and require higher medical costs. This could lead to inadequate household income, resulting in issues related to homelessness.

4) *Proportion of COVID-19 patients*: Estimation results indicate that a 1 percent rise in the proportion of COVID-19 patients is associated with a 1.555 persons per thousand population increase in the homelessness rate. The COVID-19 outbreak has significantly impacted households, primarily affecting income, causing unemployment, straining relationships within the household, and increasing the burden of medical expenses and disease prevention efforts. Household expenses rise as incomes fall. A lack of sufficient income often causes homelessness.

In general, the conclusions drawn from the analysis of the equation of factors contributing to the rate of homelessness indicate that household expenses, average years of schooling, the proportion of elderly people, and the proportion of COVID-19 patients have a statistically significant impact on the rate of homelessness, with the effects aligning with the hypotheses. So, the conclusion can be drawn from the research that factors affecting homelessness are multidimensional, including personal factors such as education and being elderly, as well as social factors such as societies with high cost of living and global pandemic situation.

Estimating the regression equation with cross-sectional data may lead to an unstable variance of the error terms, also known as heteroskedasticity problem. This study therefore employs the Breusch-Pagan-Godfrey test method to examine the issue of heteroskedasticity, which assumes that H_0: No heteroskedasticity exists. The test results revealed that the calculated chi-square probability value was 0.253, exceeding the criteria probability of 0.1. So, the null hypothesis cannot be rejected. The model does not experience heteroskedasticity problems.

The findings of this investigation align with existing research conducted overseas. The research discovered that the COVID-19 pandemic has increased the severity of the homelessness issue (Barbu et al., 2021; Rodriguezet al., 2021). This study's findings indicate that the housing prices factor did not correlate with homelessness rates. This finding contrasts with results from studies conducted in other countries, such as the United States. It is possible that using land appraisal values as a proxy for housing prices and rental fees may not be suitable, or that the cost of land and housing may not be a significant factor in homelessness. Further research is necessary to validate the findings of this investigation.

Table 4 Regression results

Dependent variable: Rate of homelessness				
Independent variables	**Coefficient**	**Standard deviation**	**t-statistic**	**p-value**
Constant	-20.315	100.703	-0.202	0.841
Unemployment rate	-0.309	1.425	-0.217	0.829
Minimum wage	0.124	0.257	0.484	0.631
Average household expenses	0.001*	0.001	1.772	0.083
Land appraisal price	-0.001	0.012	-0.065	0.948
Urbanization rate	0.154	0.142	1.086	0.283
Year of schooling	-7.516**	3.085	-2.436	0.019
Average O-NET test score	-1.033	0.852	-1.212	0.232
Proportion of the elderly population	1.520**	0.626	2.427	0.019
Proportion of foreign workers	-0.049	0.061	-0.799	0.428
Number of temple	-0.002	0.003	-0.691	0.493
Proportion of schizophrenia patients	-0.233	0.694	-0.335	0.739
Proportion of disabled people	-0.277	0.222	-1.250	0.218
Proportion of COVID-19 patients	1.555*	0.782	1.988	0.053
Proportion of patients suffering from alcohol addiction	-0.008	0.344	-0.023	0.982
Highest temperature	1.011	1.814	0.557	0.580
Precipitation	0.008	0.042	0.186	0.854
R-squared	0.352	Mean dependent variable		7.702
Adjusted R-squared	0.122	S.D. dependent variable		9.169
S.E. of regression	8.593	Akaike info criterion		7.368
Sum squared residual	3322.820	Schwarz criterion		7.951
Log likelihood	-211.399	Hannan-Quinn criterion		7.597
F-statistic	1.528	Durbin-Watson statistic		1.959
Prob (F-statistic)	0.132	Included observations		62

Note: * mean $p < 0.10$, ** mean $p < 0.05$, and *** mean $p < 0.01$
Source: Author's calculation

Conclusions and policy implications

Homelessness is a complex societal issue that stems from various underlying causes. Economic difficulties that result in insufficient income to cover essential living expenses, like housing, can be triggered by personal issues, including problems within the family. Homelessness remains a persistent issue in many societies, with a notable prevalence in urban environments. The COVID-19 outbreak, which began in Thailand at the start of 2020, has further exacerbated the issue of homelessness. The primary objective of this research is to investigate the factors contributing to homelessness by estimating an equation of the determinants of homelessness rates. The independent variables are the unemployment rate, minimum wage, average household expenditure, land appraisal price, years of schooling, average O- NET test score, percentage of the elderly population, the proportion of individuals with schizophrenia, the proportion of people with disabilities, the proportion of COVID- 19 cases, proportion of patients with alcohol addiction, the proportion of foreign workers, number of temples, urbanization rate, highest temperature, and precipitation levels. The data utilized in the analysis consists of cross-

sectional data relating to Thailand's provinces as of 2022. The results of estimating the regression equation using the ordinary least squares method found that the increasing in average household expenses, proportion of elderly people, and proportion of COVID patients has increased the rate of homelessness. Meanwhile, when the average year of schooling increases, which means that the average education level of the population increases, it helps reduce the rate of homelessness.

This study's findings may lead to the following recommendations: 1) A severe COVID-19 outbreak in a region significantly impacts local residents. The repercussions involve both the costs associated with medical treatment and reduced income due to economic stagnation or joblessness. If the social safety net system is incomplete or inefficient, it will exacerbate the hardships faced by the most vulnerable members of society. Based on the spike in homelessness following the COVID-19 pandemic, it is clear that government agencies should anticipate and plan for enhanced support systems for vulnerable individuals facing challenges during times of crisis, such as infectious disease outbreaks. 2) Thailand's growing aging population will lead to a rise in elderly citizens without a steady income. Household savings play a significant role in enabling the elderly to sustain themselves once they cease receiving employment income. If household savings are insufficient, the responsibility will ~~then~~ shift to the government's budget to offer various welfare services, such as public healthcare and housing assistance for senior citizens. The inadequacy of government welfare programs may lead to a rise in homelessness among the elderly population. Encouraging households to save for an aging population is a significant concern. 3) Education is crucial in enabling individuals to acquire the skills and knowledge necessary to secure employment and earn a living to support themselves and their families. Therefore, quality education to develop human capital in the country is a basic necessity to solve the country's economic problems, such as poverty and other social problems. Therefore, the government should allocate the education budget appropriately and spend it efficiently. 4) The cost of living constantly increases according to the country's economic development level. As a result, people who have with low incomes or whose income cannot increase in time for the rising cost of living will experience poverty. Income is not enough to cover expenses, leading to debt problems, and, in the end, it may become severe causing homelessness problems. Therefore, relevant agencies should implement supporting measures, such as providing housing or housing loans at low prices and having loan procedures that are easily accessible to low-income people. So they do not need to rely on informal loans, which previous research has found linked to homelessness (Chaiwat, 2018).

This research has important limitations in terms of the data collection utilized. The only publicly available data on homeless people is provincial data for 2022, making this study limited by the sample size of only one year. Moreover, some foreign research found that higher housing prices/rents affect homelessness. However, this could not collect data on average housing prices for each province. Therefore, only the minimum land appraisal price is employed, which may be an inappropriate proxy. Therefore, the analysis did not find a statistically significant relationship.

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