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SOCIOLOGY | RESEARCH ARTICLE

Socioeconomic impacts of the COVID-19 pandemic on the vulnerable households: empirical evidence from slum areas of Bangkok city

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Abstract: This study explores the socioeconomic impacts of the COVID-19 pandemic on urban poor households in Bangkok city and evaluates government assistance effectiveness during and after COVID-19. It aims to examine changes in key socioeconomic indicators and provide useful information from this vulnerable group for appropriate policy assistances. Accordingly, the urban poor in central districts of Bangkok were chosen as the target group for this case study, using multi-stage sampling for 500 field survey interviews to be analysed by descriptive statistics and the ordered logit model. The study found that this vulnerable group had faced significant job and income losses and experienced rising rates of debt and poverty. In addition, they faced deterioration in physical and mental health with increasing stress and overall life problem during the lockdown period. Adverse effects remained high even after the lockdown was eased. The study found that the

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PUBLIC INTEREST STATEMENT

This article statistically examines impacts of COVID-19 pandemic on the urban poor in Bangkok who were among the most vulnerable from the country's first lockdown in 2020. It overviews impacts from socioeconomic indicators and demographic factors to explore their life problem. It is found that the vulnerable group had faced significant job and income losses as well as rising rates of debt and poverty. In addition, they faced deterioration in physical and mental health with increasing stress and overall life problem during the lockdown period. Interestingly, women tend to experience higher life problem significantly during the lockdown. Among the vulnerable, the poorest group were the most affected in terms of income losses and encountering problems in receiving formal government assistance. Even after the lockdown, these adverse effects to the vulnerable group remained high. To conclude, this study suggests that government assistance should go beyond standard welfare support and temporary cash transfers toward a longer-term human development approach including creating jobs and earning opportunities for the most vulnerable groups to be able to survive post-COVID-19.

poorest group was the most affected in terms of income losses and income deficits relative to expenditure and encountering problems in receiving formal government assistance. The empirical test of overall life problem confirmed that women have higher possibility to experience life problem significantly during the lockdown period. Unemployment and income loss were significant factors leading to overall life problem as well. Finally, this study suggests that government assistance should go beyond standard welfare support and temporary cash transfers toward human development and take a longer-term approach including creating jobs and earning opportunities for the most vulnerable groups to be able to survive post-COVID-19.

Subjects: Sociology & Social Policy; Urban Economics; Urban Sociology - Urban Studies; Development Studies; Population & Development; Development Policy; Urban Development; Economics andDevelopment; Economics; Development Economics

Keywords: COVID-19; socioeconomic impacts; urban; poor workers; vulnerable group; Bangkok; Thailand

1. Introduction

Since the novel coronavirus (COVID-19) spread across the world and became a pandemic in early 2020, its impact on human lives has been enormous and beyond expectations. The United Nations (2020) noted that COVID-19 hit hard an already weak and fragile world economy, plunging it into a recession with historical levels of unemployment and deprivation. It is said that the COVID-19 pandemic has created one of the worst economic and human crises since the Second World War (ILO, 2020a). Starting as a health-related issue, COVID-19 exerted larger economic and social effects than anyone could have imagined. The adverse effects are transmitted via many channels and contagious globally.

As it was a deadly emerging disease with no vaccine or pharmaceutical prevention and characterized by fast transmission by carriers who were asymptomatic at early stages, the spread of the virus was difficult to prevent. Non-pharmaceutical interventions (NPIs) were the only prevention measures available, as mentioned in Hevia and Neumeyer's (2020) United Nation Development Programme (UNDP) report, namely, social distancing and hand and body washing. Necessary distancing measures in many countries to contain the spread of the disease through quarantines, travel restrictions and lockdown of cities resulted in a significant reduction in demand and supply in many economic sectors. Economic activities in transportation, retail trade, leisure, hospitality and recreation were all shut down. As a result, the implementation of NPIs by governments in many countries, commonly with lockdown measure, resulted in adverse effects on economic systems and human activities, in turn leading to social-related problems. The report explained the effects of COVID-19 on economics via three channels, namely, 1) direct effects from NPIs on economics, production and services; 2) a reduction in international trade and product prices leading to a reduction in production and 3) global financial shock leading to the movement of liquidity from high-risk to low-risk sectors and financial capital leak from less developed economies, resulting in high financial risk and currency depreciation in those countries. Bundervoet, T, et al. (2021)'s study for the World Bank concluded channels of economic shock to household's welfare and well-being, namely, 1) an impact on labor income due to the decline in aggregate demand, potential supply disruptions and the associated decrease in employment or the returns to productive activities (particularly those in vulnerable sectors such as tourism and services need personal interaction; 2) non-labor income negatively affected through a decline in remittances and domestic private transfers and positively affected through a potential scale-up of public transfers and government-provided assistance; 3) disruptions in the functioning of markets could lead to price increases and rationing of basic consumption goods and 4) disruptions to service delivery, particularly health and education services, have important long-run effects through the impact of health and education in childhood on future socioeconomic well-being. Moreover, Otker-Robe and Podpiera (2013) points out

that adverse effects from economic recession can affect social sectors through channels such as the income reduction, increased poverty and inequality as well as social and political problems such as mental health, violence, migration and the neglect of the fragile groups.

Measures to curb the spread of the virus, transmitted to socioeconomic factors via such channels, have exacted high costs on the global economy and development. Worldwide, economic output project has contracted by 4.4 percent in 2020 (IMF, 2020). Particularly, this economic contraction in developing countries has large consequences on poverty, which projected to increase by 119 million to 124 million in 2020, which is the first increase in global poverty since the Asian financial crisis on 1997/98 (World Bank, 2020a). The International Labor Organization (ILO) estimated that about 25 million workers lost their jobs in labor markets worldwide, with the most affected sectors in services, tourism and retail trade (ILO, 2020b). Particularly, global tourism suffered an estimated loss of $1.3 trillion in export revenues—more than 11 times higher than that during the 2009 global economic crisis, according to the World Tourism Organization, which warned that up to 120 million tourism jobs were directly at risk (Zarrilli & Luomaranta, 2021). For Asia Pacific, ESCAP (2021) estimates that working hour losses totalled the equivalent of 140 million full-time jobs in 2020, while prolonged school closures severely affected education. This crisis pushed a further 89 million people in the Asia Pacific region back into extreme poverty. Not only direct impact on health but also indirect impacts on social and mental health of the pandemic are considerable and likely to persist (OECD, 2020). Taken together, these distortions are likely to have considerable adverse effects on human capital accumulation and productivity. Policymakers, thus, have had to make tough decisions between saving lives and saving livelihoods.

UNCTAD (2020) indicated that the impact of COVID-19 is high and deep in lower- and middle-income countries as they were already entering recession by late 2019. In addition, Laborde et al. (2020) noted that export restrictions imposed by some countries have disrupted trade flows for staple foods and COVID-19 severely impact food insecurity via the inaccessibility to food; shifts in consumer demand toward cheaper, less nutritious foods; and food price instability. Kansiime (2021) assessed implications of the COVID-19 pandemic for household income and food security in two East African countries by online survey and found that more than two-thirds of the respondents experienced income shocks due to the COVID-19 crisis and worse food security and dietary quality with income-poor households and those dependent on labor income were more vulnerable to income shock. Morgan and Trinh (2021)'s study for the Asian Development Bank Institute with a survey by telephone interviews in eight ASEAN countries shows that about 73% of the households in the sample experienced a decline in income. Thailand, in particular, experienced 76% income loss, of which 11% lost more than 75% and 12% lost between 50 and 75% of income. On average, 44.4% of employees in the samples had either lost their jobs (temporarily or permanently) or had experienced a workload cut, with Thailand's average of 48.2% higher than the regional average. Its empirical results suggest that various household characteristics, including household income class (before the COVID-19 pandemic) and household demographic factors, affect the likelihood of a decline in income. The study also notes that while various studies have examined potential impacts of the pandemic on global and national economic indicators such as poverty, government expenditures, GDP growth, budget deficits and employment, there is limited information on how the pandemic and associated lockdown policies are affecting individuals at the household level. Economic effects of a pandemic may disproportionately impact members of the society, depending on their income status, livelihood strategies, access to markets, etc. Therefore, it is important to understand the household-level impacts as well as the support mechanisms that could contribute to income smoothing.

The strictly control of COVID-19 pandemic creates social and economic impacts to everyone, but the most vulnerable seems to be those who cannot afford social distancing work and living, those who work with insecurity, i.e., those in the informal sector lose jobs due to the shut down of activities with no compensation. Thus, the urban poor working in the informal sector in the big urban area with congested economic activities are most affected. As reviewed by Boza-Kiss et al.

(2021a), slum dwellers in the world's cities have been particularly hard hit, because of precarious and overcrowded housing conditions, lack of basic infrastructure and amenities and a high concentration of the socioeconomically disadvantaged, resulting in even more negative consequences of lockdown measures. With many slum inhabitants working in the informal sector, many have been left either without jobs and income or live in unsafe conditions to survive. Thus, lockdown measures that were the first response in many countries to deal with the pandemic were difficult to implement and unsuited for such settlements because overcrowding made physically social distancing impossible for slum dwellers, as discussed in Chirisa et al. (2020) and Wasdani and Prasad (2020). In addition, a lack of access to adequate energy and ICT services, a critical issue for most slums even prior to the pandemic, exacerbated the vulnerabilities of populations living in slum areas. As noted in Boza-Kiss et al. (2021b), the risks of the pandemic and restrictions following containment measures have been felt most acutely by the poor, the vulnerable, those in the informal sector, those without savings and safety nets, school children in households without electricity and internet and workers in the informal sector who do not have the option to telework, crowds living in slums where women have disproportionately been impacted. Similarly, Attanasio and Rajan (2020) noted that the pandemic's impacts are unequal and reinforcing pre-existing inequalities. COVID-19 has affected poorer households and individuals far more severely, impacting their health and economic outcomes.

As the outbreak has especially affected vulnerable groups whose work often does not permit social distancing, such as the poor and unskilled workers in informal sectors living in slums, this study examines socioeconomic impacts from the restricted transmission controls on the poor and disadvantaged who are likely to be most vulnerable to this crisis and should be protected.

Thus, the study aims to add on knowledge on impacts of COVID-19 on vulnerable households in the case of Thailand by investigating the situation in the most adversely hit province/area and group, especially in times that not many field survey were undertaken. The study was designed to answer several research questions: who are the most vulnerable group; the extent to which the vulnerables are affected by unemployment, the size of their income loss, expenditure and debt; the increase in the poverty, overall life problems, health and stress, family-related problems and how they cope with the situation including assistances from others; and what are significantly affected factors to the overall life problem during and after the lockdown periods of the pandemic, compared to the pre-pandemic situation. The study would provide new information and shed some light for future policies that have to be properly prepared for the following outbreaks and particularly designed for different target groups. The following sections will present the country situation, research framework and methodology, results and discussion, and conclusion, respectively.

2. Thailand situation

In Thailand, the spread of the coronavirus started in early 2020, initially among those returning from abroad. At first, it spread in clusters based on attendance at entertainment and sports complexes (i.e., big boxing venues), primarily in Bangkok. After increasing numbers of cases in March 2020, the government ordered a state of emergency and locked down Bangkok from March 26 to 30 June 2020. The lockdown resulted in the closure of all department stores, shops, restaurants, entertainment and sports activities, including fitness gyms and public parks, as well as closure of all schools and academic institutions in the country. People were requested to stay home for the nation. Curfews were also implemented to restrict people from going out for activities at night. People were also restricted from moving across provinces; for example, the Thai New Year holiday in mid-April was replaced by work from home days due to the fear of a massive move of people from Bangkok to the countryside and an ensuing spread of the virus. International flights to and from the country were prohibited except for special exemptions that required a 14-day quarantine.

Social distancing was made a priority, typically congested places were closed, and people were asked not to go outside unless necessary. The government attempted to control social mobility, asking people to stay home and to work or study from home. Decisions to control disease transmission by implementing lockdowns and prohibiting activities, as well as decisions to ease such restrictions, were under the consideration of the Center for COVID-19 Situation Administration (CCSA), chaired by the Prime Minister. Based on CCSA recommendations, some location restrictions were gradually relaxed during May and June, allowing activities deemed low risk to reopen, but all Thai schools were closed until the end of June. Schools did not reopen until 1 July 2020, about one and a half months after other restrictions were lifted.

Although the goal of these actions was to contain the coronavirus, the sudden restrictions across the board initially created some chaos. For instances, the immediate order by the Bangkok Metropolitan Administration (BMA) to close all department stores, entertainments and markets on 22 March 2020 led to an outflow of workers from Bangkok to their hometowns in the countryside that night due to fears of having no work and no income to live in Bangkok, which can be seen from the congestions at main transport stations on the day of announcement as people urge to other regions. At the same time, people in their hometowns in the provinces were afraid that the workers returning from Bangkok might be carrying the virus. Returning workers were required to be quarantined in their homes for 14 days and monitored by villages' volunteer public health workers. These measures kept the number of infections in the countryside under control during the first outbreak in 2020.

However, the strict control has created socioeconomic problems such as unemployment and loss of income, which led to increases in poverty, debt and stress. In addition to the lockdown, Thailand implemented a state of emergency and a curfew, which further contracted the economy. The World Bank (2021) estimated that 340,000 jobs were lost in the second quarter of 2020 during the lockdown period due to increasing underemployment and wage reductions. Although the government eased the lockdown after June 2020, the economic engine has not fully recovered due to low demand and supply, and some main sectors still face problems; for example, the tourist sector, which contributes about 12–15% to the GDP with about 40 million international tourists yearly, is still restricted. Many who work in the service-related sector, which is primarily an informal sector, are still affected by the adverse impacts of the economic slowdown. In the second quarter of 2020, the GDP contracted 12.2% and the unemployment rate increased to 1.95%, double its usual rate; underemployment sharply increased as well. Although the government eased the lockdown policy in July, unemployment rates remained 2–3 times higher than during the same period of the previous year (2.15% in July 2020 and 1.86% in August 2020). Many economic sectors, especially in services and SMEs, have still not recovered, affecting many people who cannot work fully or who lost their jobs. The World Bank (2021) estimated that the number of Thailand's poor increased by 1.5 million and the poverty rate soared to 8.8%. Over the course of 2020, the Thai economy contracted about 6.5%, with around 300 billion baht (approximately 18% of GDP) spent for cash transfers and relief measures. These kinds of social protection measures are similar to most countries delivered by June in the form of temporary (typically 3 months) but substantial enhancements of cash transfer programs (Laborde et al., 2020).

For the vulnerable groups, adverse impacts have unequally affected areas and population groups. Some country studies indicate a broad picture from macro data. As Lekfuangfu et al. (2020) noted, the groups that experienced the most adverse impacts and difficulties adjusting their work places were those with relatively low salaries (below 12,000[1] baht a month), while those having beyond 30,000 baht were unlikely to have much effects due to easier change in jobs. Furthermore, relatively old age workers (more than 46 years old) and those with lower education faced more difficulties to work from home, while university graduated were most ready to adjust their work and having less adverse effects. In terms of business closure, Bangkok and main regional cities got highest negative effects. Lerdnithat and Jitsuchon (2020) concluded from online survey that the most fragile groups experiencing the most negative impacts were households with the elderly, severe illness and young

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children, as they faced more income loss from insecure jobs and took care of fragile members as well as faced more difficulties to go doctors and health care centers.

Thus, as the most vulnerables from COVID crisis in Thailand seem to be those with low income earning and having fragile family members in households, more detailed studies to further explore what happen to these vulnerable groups to provide more information would be useful for academic and policy design. As the urban poor often work in the informal sector and rely on daily income, with no employment insurance from firms or the government, they are likely to be the group most affected by NPI measures. In that regard, additional field studies would contribute to filling information to the gap of knowledge. Particularly, in time of COVID-19 that requires personal distancing, little is known about vulnerable households in slum areas.

When social distancing measures were implemented, the urban poor in slum areas were often unable to comply with social distancing due to the limited space in their residences/environment as well as their lack of skills and technology to work from home. Those in slums most earned income from servicing other people outside; for instance, by working as daily cleaners, motorcycle riders, garbage collectors or street vendors, which require contact with large numbers of people. Therefore, it was difficult for the slum people to adjust or maintain their work from home during the strictest transmission control period. For many, that time was a period with no work and no income. The immediate loss of job and income by heads of family can affect other family members and increase stress and life problems. Thus, the problem of strictly controlling the virus also transmits to social problems and encompasses a wider scope than the individual infected. Channels of transmission of health-economic-social impacts, as well as the links with outside assistance and self-adjustment during this period, are depicted as the research framework in Figure 1.

Figure 1 illustrates the channels of transmission of adverse effects from the outbreak of the virus from health to economic and social sectors via restrictive non-pharmaceutical interventions (NPIs) such as social distancing measures and travel control. Restrictive transmission controls that suddenly closed down activities and constrained mobility negatively impacted the income of many workers. Retail trade and tourism were most obviously affected. The country's manufacturing sector was affected by both demand and supply shocks from the domestic lockdown and disrupted supply chains from international traders, as mentioned in ILO (2020c).

The government implemented overall remedial measures to mitigate impacts on the vulnerable, while the private sector, NGOs and temples are also helped by providing free food for those vulnerable during the lockdown period. Some forms of assistance are provided to the vulnerable

Figure 1. Channels of transmission of COVID-19 impacts on economic and social factors affecting the vulnerable.
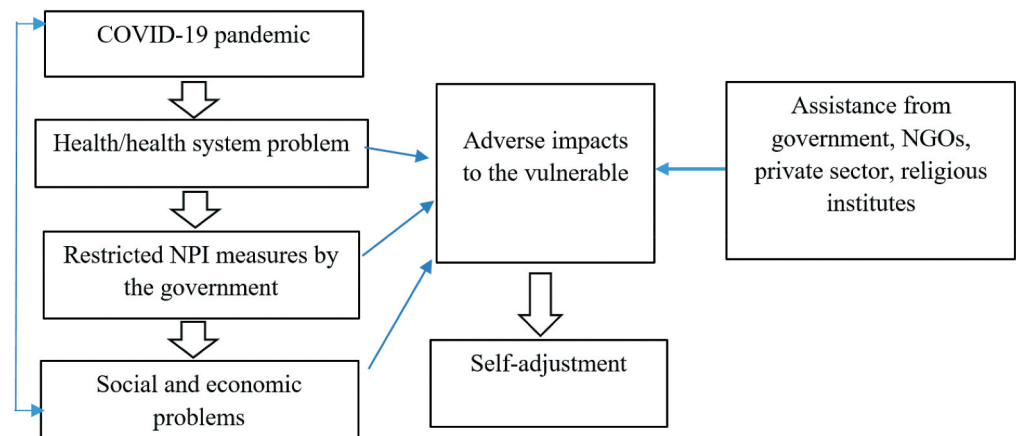
who also have to adjust themselves while facing problems. The vulnerable also had to adjust their ways of living due to the situation. The overall framework of this study displayed in Figure 1.

As adverse socioeconomic impacts are also concentrated in the most economically concentrated areas where most of the economic activities are forced to close, research finding from a case study in the highly affected area is worth exploring. Bangkok, the most strictly controlled area during the lockdown and the area with the most concentrated economic activities, was the place most affected by the country's first lockdown. Informal workers, including the urban poor, were the most vulnerable population due to severe and sudden job and income losses. Particularly, those in slum areas seem to face a lot of problems from the lockdown and social distancing policies. This research thus explores impacts on the vulnerable in urban slum areas in terms of changes in economic and social factors, including physical and mental health, as well as forms of assistance and other life adjustments during the outbreak both during and after the lockdown.

3. Research approach and methodology

This case study identifies target groups and areas in which to examine the impacts of the COVID-19 pandemic crisis on the most vulnerable. Therefore, this study focuses on urban poor workers in central Bangkok. The following sections explain area and sample selection and methodology.

3.1. Slum areas in Bangkok

The slum areas are commonly found near congested commercial and construction areas, warehouses or previous piers that long-time established, transportation congestions such as besides railways and under highways. Their residences with one- or two-storey houses are congested in small streets/narrowed walkways. Some small households split from extended families, and some parts of slums' households may lack housing registration and cannot access to public utilities such pipe water and electricity, resulting in high private costs in access to those utilities. Some residents in those areas may not have formal ID or house registration numbers, leading to problems in confirming their identities when they need to access public assistances, including in times of COVID-19 that these vulnerable face difficulties in identifying themselves without format registration documents[2] in addition to not familiar with using online tools. Some big communities have small health units and health volunteers as well as NGO visits and may engage in those volunteers' development projects. The study surveyed in the daytime and mainly meet the elderly or the middle-age groups as well as more women; the seniors are the heads of their families, which may

Figure 2. Some community pictures under the survey.

include the fragile groups such as children, the elderly and the disable. Figure 2 shows some part of slum areas from the survey.

3.2. Data sources and collection methods

The study utilized data from both secondary and primary data sources. Secondary data from the Bangkok Metropolitan Administration (BMA) are used for selecting target districts or locations as well as information from the Community Organizations Development Institutes (CODI) of Ministry of Social Development and Human Security is reviewed for selecting urban poor communities in those districts. Within these selected communities, vulnerable households for the primary survey were suggested by village heads and health volunteers. Thus, this case study collected primary data from the urban poor in Bangkok's slum areas in the core business districts from 11 districts for totally 500 samples (beyond the required sample size of 400 set by Yamane, 1967).

The survey used paper questionnaire (for almost 50 questions), consisting of 4 parts: general personal information, socioeconomic indicators, measures of assistance and their effectiveness, and resilience or self-adjustment. In addition to the quantitative measurement, the interview included some opened questions to reflect their problems and suggestions for policies. While the survey was conducted from late August to mid-September, 2020, which was the period after the first lockdown (implemented late March to June, 2020), questions were asked to collect data for the time periods before, during and after the lockdown. Three time periods were examined with reference to the COVID pandemic to compare the magnitude of changes in economic and social indicators over these times: before the lockdown, during the lockdown and after the lockdown.

The unit of analysis is vulnerable households with low income in slums. However, prior to the survey, we do not know exactly the vulnerable' income levels that they may fall under categories of the poor, the near poor or relatively higher income groups compared to community members. In addition, their income levels can change due to the lockdown and post-lockdown situation, which will affect their status of being the poor by income standard. These parameters and changes in other socio-economic indicators are what we also aim to explore in the survey.

3.3. Sample strategy

The sampling strategy is multi-stage sampling. First, the study selected urban areas/districts in BMA where the urban poor tend to concentrate on then-selected communities (suggested by CODI) in those districts and finally focused on households in those communities suggested by expert organizations and individuals (i.e., health volunteers or village heads).

In terms of areas, the lockdown affected large urban areas with concentrated economic activities and employment, where the majority of the urban poor live. As explained by urban economics theory (i.e., Fujita, 1989; McCann, 2001), the low income group is likely to live in the inner city due to high transportation costs and economic agglomeration. Low income groups can benefit from various activities in the city with earning opportunities as well as available public utilities. The urban poor are likely to live in the central city where they can have various options to earn, primarily from the informal sector, and can take advantage of the city's free public services. Thus, this study selected the Bangkok metropolitan area, which is the largest urban economic area in the country and likely to be most affected by the lockdown, and central business districts (CBD) of Bangkok as a case study for the urban poor area. The survey was purposive to conduct in 11 inner districts of Bangkok, which are highly commercialized and tourism-focused and thus highly affected areas.

The next step is selecting the urban poor areas (slums) in 11 inner districts of Bangkok; there are about 30 suggested communities in total. In each community, the research team focused on vulnerable households with fragile members, suggested by village heads or health volunteers in those communities. The proportion of samples in each district is based on the size of slum

communities' population in each district; there are about 15–20 sample in each community. Then, random sampling in each community is used in order to attain 500 samples in the combined areas.

3.4. Analytical approach

The study uses descriptive statistics and empirical test to examine impacts from socioeconomic indicators. Changes are reported in descriptive statistics to compare impacts during the pre-lockdown, lockdown and post-lockdown periods in terms of economic indicators such as income, expenditure, debt, savings and poverty rate, as well as social indicators related to physical health and mental health, life problems and more. Other qualitative data are also added for detailed analysis.

The poverty line used in the study (to determine the poor and the near poor) was adjusted from the latest poverty line established by the National Office of Economic and Social Development Board (NESDB) in 2018, which was 3,214 baht a month. Considering a 1% yearly inflation rate, the study used a poverty line for Bangkok in 2020 of about 3,300 baht a month (about 100–110 USD with exchange rates fluctuating between 30 and 33 baht per 1 USD). Thus, 3,300 baht monthly is the cut-off poverty line in this study. In addition, the near poor group is defined for those who have income not beyond 20% above the poverty line, so we use the income range of 3,301–4,000 baht for the near poor. Thus, monthly income classification in this study is divided based on this poverty line and the near-poor income level.

The level of overall life problems was reported by respondents, who used their own personal scaling evaluation, similar technique to that used for subjective indicators such as subjective well-being/happiness or life satisfaction evaluation that requires self-assessment (i.e., Grilli and Rampichini (2014); Kittiprapas, 2020; Pukeliene and Starkauskiene (2011); Van Praag, 2007; Veenhoven, 2007). Respondents were asked "Overall, what are your levels of problems in life have you faced from impacts of COVID-19 situation? There are four choice answers for this case: from none, a little, medium and a lot (which are numeric into 0, 1, 2 and 3, respectively).

Questions related to satisfaction with life assessment and expectations are usually ordinal in nature (Grilli & Rampichini, 2014), and in this case, dependent variable Y is in ordered scales (translated from the answer of that single question); thus, the study uses the order logit model as an analytical tool. This model was tested with a sample size of 500, beyond the required sample size of 400 set by Yamane (1967).

The empirical model aims to test the factors significantly affecting overall life problems (that can be an overall effect from various socio-economic indicators due to COVID-19 crisis). To empirically test factors affecting overall life problems (as dependent variables), we used the model $Y = f(X_i)$.

Y_1 represents the level of overall life problems in the ordinal scale.

X_i are demographic factors such as sex, age, education and unemployment due to COVID-19 and socioeconomic factors such as increased debt burden, income loss, being head of the family and number of fragile members in the family.

In fact, the foundation of the model selection process was based on theoretical and practical concerns. However, as there is no direct measurement for the overall life problem (which is the focus of this study), the study applied classifications of quality-of-life concepts from research studies reviewed by Pukeliene and Starkauskiene (2011) and focused on the individual level of quality-of-life variables that are internal environment, namely, demographic (individual), family (social), health (physical), income and outside assistances (material well-being).

For this case study, the rationale to select independent socioeconomic variables (xi) is COVID-19-affected variables during the lockdown; thus, we choose variables that show changes during the

period such as employment, the loss in income, the increase in debt burden, and outside assistance, as well as personal burden affected by the COVID-19 situation such as numbers of fragile members to be taken care of in the family and being head of the family, apart from basic demographic factors such as sex, age and education. The description of each variable is presented in Table 1. As the dependent variable (y) is ordinal, it is reasonable to use the ordered logit model (i.e., Grilli & Rampichini, 2014; William, 2016).

3.5. Description of variables
Details of each variable in the empirical test are shown in Table 1.

4. Results and discussion
Before discussing changes in socioeconomic indicators, characteristics of the sample group are provided. Table 2 displays the demographic characteristics of the surveyed group. The majority were female (65.4%) and between the ages of 46 and 60 years (42%), followed by those older than 60 years (about 30%). Most respondents had only a primary school education

Table 1. Description of variables used in the models		
Variable	**Description**	**Measurement**
Dependent variables		
Overall life problem	Levels of life problem in general, evaluated by respondents	Translated choice answers into ordinal numbers with high numbers reflect higher problems, i.e, 0 = none, 1 = some, 2 = medium and 3 = a lot
Independent variables		
Demographic factors		
• Age	Age	Years of age
• Sex	Sex	1 = Male, 0 = Female
• Education levels	Levels of education attainment	Ordinal from low to high levels, 1 = lower than primary 2 = primary level 3 = secondary level 4 = higher than secondary
• Employment status	Distinguish the employed and the unemployed due to COVID-19 lockdown	1 = Unemployed 0 = Employed
Economic factors		
• Increased debt	The increase in the debt amount, compared to prior to COVID-19	Levels of debt amount increased
• Income loss	The size of loss in income, compared to prior to COVID-19 lockdown	Numbers of income deduction between the two periods, representing the size of income loss in absolute term.
Social factors		
• No. of fragile members	Fragile members in the family, i.e, children, the elderly and the disable with health problems	Total numbers of these fragile groups in the family
• Being head of the family	Role as the head of the family	1 = Being head of the family 0 = Not
Other factors –assistance from outside	Assistance from government, NGOs and private sector	1 = Receive any kind of assistance 0 = not received

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Table 2. Demographic data of the sample: sex, age, employment status and reasons for unemployment and occupation

Demographic Variable	Number	Percent
Sex		
Female	327	65.4
Male	173	35.6
Age		
15–30	39	7.8
31–45	102	20.4
46–60	212	42.2
61–75	122	24.6
More than 75	25	5.0
Education level		
Lower than primary school	66	13.2
Primary school	233	46.6
Secondary school	137	27.4
Vocational education	37	7.4
University	27	5.4

Employment status	Number	Percent
Employed	270	54.0
Unemployed	230	46.0
Unemployed due to COVID-19 lockdown and effects	*(159)*	*(72.6)*
Unemployed for other reasons	*(71)*	*(27.4)*

Occupation	Number	Percent
Small merchants/street vendors	85	31.5
Private employee	32	11.9
Public employee	10	3.7
Daily paid workers/general services	105	38.9
Garbage collectors	10	3.7
Motorcycle drivers/grab bike	13	4.8
Others	15	5.6
Total	270	100

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(46.6% percent). This reflects that most of the workers are unskilled as about 60% of them have education at the primary and lower level.

Employment data show that about 46% of them were unemployed during the survey period. Of these, 73% lost jobs due to the COVID-19 situation since the lockdown. For the employed, survey data show the occupation category, indicating that most of the employed worked as daily paid workers in general services (39%) or as small merchants and street vendors (31.5%). They were informal workers who were still at risk due to the continuing uncertainty of the COVID-19 situation. Those who were unemployed due to the COVID-19 situation had previously worked in these informal sectors as well but were easily laid-off when economic activities were shut down and social distancing was required.

4.1. Economic impacts

The economic impacts of the COVID-19 pandemic were examined through participants' changes in levels of income, expenditure, debt and savings as well as poverty rates over the periods of the transmission: pre-lockdown, lockdown and post-lockdown. Table 3 shows changes in the numbers and the percentages of these variables over these three periods.

Table 3 displays the adverse impacts in terms of economic indicators such as average income, expenditure, debt and savings. Although income and expenditure had a similar trend of dropping during the lockdown and gradually increasing afterward, debt burden continued to increase even after the lockdown. In contrast to the continuous increase in debt burden, savings kept decreasing, with more deficit accumulating over the three periods. Average income contracted sharply during the lockdown (−60%) and still reduced by 36% after the lockdown compared to pre-lockdown levels, showing that adverse effects remained high. Although average expenditure also declined during the lockdown (−35%) and afterward (−18%) as people tend to spend less due to fewer outside activities and reduced income, the drop in its size was less than the drop in income; thus, it was not surprising to witness a trend of increasing debt and decreasing savings. Due to an increasing average debt burden over the three periods, average savings decreased over the three time periods. The survey results also showed that 34 respondents (6.8%) became newly indebted during the lockdown.

This study further examines the effect of COVID-19 on income loss at each income level. Table 4 categorizes the vulnerable by income group pre-lockdown, during the lockdown and post-lockdown to reflect changes in income status over the three periods. The classification of income is based on the level of classification of the poor (below 3,300 Baht), the near poor (between

Table 3. Monthly average levels and percentage of income, expenditure, debt and savings (in baht): pre-lockdown, lockdown and post-lockdown				
Periods	**Average monthly income**	**Average monthly expenditure**	**Monthly debt burden**	**Average savings**
Pre-lockdown	8,167	6,296	17,929	− 16,059
During lockdown	3,233	4,067	19,098	− 19,932
% changes between pre-lockdown and lockdown	−60%	−35%	7%	−24%
Post-lockdown	5,218	5,170	22,737	− 22,690
% changes between pre-lockdown and post-lockdown	−36%	−18%	27%	−41%

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Table 4. Number of participants at each monthly income level pre-, during and post-lockdown			
Monthly income level (in baht)	Number of participants at the monthly income level pre-lockdown	Number of participants at the monthly income level during lockdown	Number of participants at the monthly income level post-lockdown
Less than 3,300	92	342	216
3,301–4,000	50	51	62
4,001–7,000	123	56	110
7,001–10,000	116	38	66
10,001–15,000	88	5	28
More than 15,000	31	8	18

3,300–4,000 Baht[3]) and approximately for relatively middle- and higher-income groups in these low-income communities.

Table 4 shows that during the lockdown, a large number of participants fell below the poverty line (monthly income less than 3,300 baht). This number increased from 92 before the lockdown to 342 during the lockdown, and fewer participants earned more than 4,000 baht during the lockdown than before the lockdown. Moreover, after the lockdown, the number of participants who fell below the poverty line remained high, at 216 persons, which is about 2.3 times higher than before the lockdown period. The number of near poor groups (between 3,301–4,000 baht) has increased toward the post-lockdown, while the number of participants with income greater than 4,000 baht fell since the lockdown, and many dropped into the lower-income level or below the poverty line especially during the lockdown. Table 5 shows the number and percentage changes of those below the poverty line and their average monthly income level in all three periods.

The table clearly shows that the number and percentage changes of those below the poverty line increased compared to pre-lockdown. The average monthly income of participants below the poverty line dropped from 2,273 pre-lockdown to 1,194 during the lockdown and slightly increased to 1,702 afterward. Overall, the poverty rate increased from 18.4% before the lockdown to 68.4%, an increase of 50 percentage points, during the lockdown. Adverse effects remained even after the lockdown was lifted, as the poverty rate was high at 43.2%. This reduction in income reflects the hardships that participants faced from the drop in earnings and work opportunities since the start of the COVID-19 outbreak. This is consistent with 2020 concluded from their global studies that the major impacts of the pandemic on poverty and food security are more likely to come from shocks to household incomes.

This large increase in poverty among the poorest group in Bangkok, who are the most vulnerable segment of the population, is not a surprise given the rise of poverty in Bangkok in general. United Nations Thailand (2020) estimated that among the rise in urban poverty due to the COVID-19 situation, Bangkok was the worst affected and its residents had the highest informal debt.

Table 5. Number and average income of the poor in pre-, during and post-lockdown				
Periods	Numbers (persons)	Average income in each period (Baht/Month)	% Change of income during COVID-19	% Change of Number of the Poor
Pre-lockdown	92	2,272.83	-	18.40
During lockdown	342	1,194.13	(−47.46)	68.40
Post-lockdown	216	1,701.85	(−25.12)	43.20

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The adverse impacts from the indicators discussed so far confirm that negative impacts remained in the post-lockdown period and were likely to last for an extended time. It seems unlikely that any economic indicator would revert to pre-crisis levels in the near future.

In addition to the sharp increase in poverty due to COVID-19, this study also examines the ratio of expenditure to income for each income group to determine whether participants had sufficient income for basic living expenses during the difficult period. Generally, the data show that the average ratio of expenditure to income was highest in the lowest income group (see Table 6), even in the pre-lockdown period, indicating that the poorest income group did not have sufficient income to support daily living expenses even before the pandemic hit.

This table shows that the poorest group suffered the most, with the highest ratio of expenditure to income, but this ratio increased during the COVID-19 crisis even after the lockdown was lifted, as shown in Table 7.

It is obvious that the ratios of expenditure to income increased for every income group after the lockdown. This is due to the fact that income decreased more than expenditures in that period, resulting in a higher ratio of expenditure to earning than that in the pre-lockdown period. Those below the poverty line, which accounted for 43.2%, had the highest expenditure to income ratio with 1.68 (compared to 1.04 pre-lockdown) among all income groups. The continuous increase in the ratio of expenditure to income was clearly an effect of the COVID-19 crisis.

One conclusion from Tables 6 and 7 is that the poorest group (below 3,300 baht) had the highest ratio of expenditure to income (greater than 1), showing inadequate income for participants' basic cost of living. The near poor (income 3,300–4,000 baht) had the second highest ratio of expenditure to income, which was also greater than 1, showing that their earnings could not cover their expenditures as well. As the group income increases, this ratio decreases. These trends are consistent in pre-COVID-19- and COVID-19-affected periods. Also, all income groups consistently experienced the increase in this ratio after COVID-19, but the poorest group experienced the highest increase in this ratio.

These data demonstrate that the poorest were likely to be indebted because they did not have enough income to cover their basic living expenses. Survey data also showed that the poorest group had the highest ratio of debt to income, 0.74 in the post-lockdown period, which tended to decline as the income level increased. The high ratio of debt to income in the poorest group reflects that about three quarters of their earnings must be allocated toward paying back debt.

Facing such a loss of income and jobs due to the COVID-19 situation, it is difficult to imagine how the poor live with this situation. According to our interviews, some relied assistance from

Table 6. Ratio of expenditure to income by income group pre-lockdown				
Monthly income levels before lockdown (in baht)	Average income	Average expenditure	Average ratio of expenditure to income	Number of participants
Below 3300	2,272.83	2,373.91	1.04	92
3301–4000	3,854.00	3,876.00	1.01	50
4001–7000	6,080.49	5,421.06	0.89	123
7001–10,000	9,229.31	7,005.17	0.76	116
10,001–15,000	13,375.00	9,712.34	0.73	88
More than 15,000	15,777.31	10,589.80	0.67	31

Table 7. Ratio of expenditure to income by income groups after the lockdown				
Income levels post-lockdown (in baht)	**Average income**	**Average expenditure**	**Ratio of expenditure to income**	**Number of participants**
Below 3300	1,701.85	2,866.57	1.68	216
3301–4000	3,906.45	4,482.26	1.15	62
4001–7000	5,966.36	5,627.27	0.94	110
7001–10,000	8,903.03	8,090.91	0.91	66
10,001–15,000	12,639.29	9,389.29	0.74	28
More than 15,000	16,791.30	11,736.96	0.70	18

outside sources, such as the government, private sector, NGOs or free food from temples. Many had informal debt, and the average debt size increased even after the lockdown period due to unemployment and decreased earning opportunities, reflecting the adverse effects on the economy. Some became newly indebted during the lockdown and carried this burden into the post-lockdown period.

4.2. Social impacts

Although some social indicators are difficult to quantify, we asked respondents to rank their social problems as subjective indicators, for example, subjective physical and mental health status, levels of stress and levels of overall life problems. At that time, Bangkok's urban poor was not the main cluster spreading the virus and no participant in the survey had COVID-19. However, the survey asked about other health problems participants might encounter in times of difficulties.

The survey asked questions concerning COVID-19's effect on their physical and mental health, especially during the lockdown when they had fewer social and physical contacts. Table 8 shows the results.

Table 8. Physical and mental health problems during the lockdown period		
Physical and Mental Health Problems	**Number**	**Percent**
1. Did you have physical health problem during the lockdown period?		
No	310	62
Yes	190	38
2. Did you have family members who were sick during the lockdown?		
No	245	49
A Little	217	43
A Lot	38	8
3. Did you have family members facing psychological problems during the lockdown?		
No	236	47
A little	210	42
A lot	54	11

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**Figure 3. Level of stress experienced during the lockdown period.**
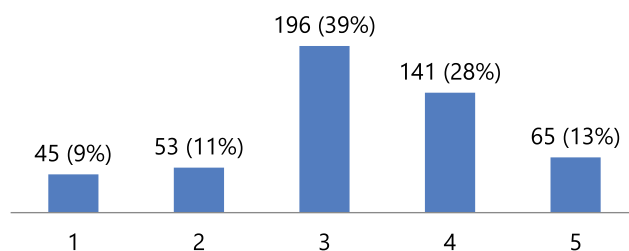
As reported in Table 8, a majority of respondents (62%) did not have physical health problems, while some of their family members did (51%). Furthermore, 53% reported psychological problems among family members during the lockdown, and 11% reported severe problems. These numbers seem to reflect that the COVID-19 crisis affected psychological health more than physical health. Even those who did not contract the virus were affected by its indirect social impacts. Figure 3 shows their reported levels of stress.

Figure 3 shows the distribution of their reported level of stress experienced during the lockdown period (ranked on a 1–5 scale, where 1 represents the lowest level of stress and 5 the highest). The majority of them (39%) reported a stress level of three, representing a medium level of stress, while 28% reported a slightly higher level of four and 13% reported the highest level of five. The distribution shows a trend of medium to high stress. According to the interviews, feelings of stress resulted from debt, unemployment and income loss.

This study's findings on adverse psychological impacts are consistent with other case findings in other parts of the world, for example, Brodeur et al. (2021) concluded from their review the negative effects in well-being (and mental health) and the loneliness and depression in many countries that called for public psychological assistance; a cross-country study by Greyling et al. (2021) found the negative effect of lockdown on happiness due to uncertainty about the future job market. Also, Anaya et al. (2021) indicates that the consequences of the pandemic for mental health are substantive, but impacts are uneven among various groups. Specifically, the mental health problems associated with the pandemic appear to be much more for females, those with children, ethnic minorities and migrants as well as those under financial stress. Moreno et al. (2020) also found that adverse impacts on physical and mental health of populations exacerbate health inequalities, especially in people with pre-existing mental health disorders. Thus, the pandemic is expected to have much more consequences in mental health and life problems to the disadvantaged.

Additionally, social impacts spread widely from individual to the whole family members. For instance, an unemployed head of the household affected many family members in their

Figure 4. Number of family members in households by number and percentage.
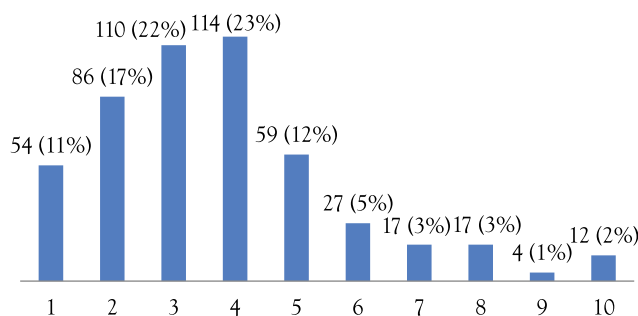
household. Even in low-income areas with limited housing space, some extended family members lived together. Figure 4 shows the number of family members, in which some households had as many as 10 members.

For the figure, while the majority of households contained 3 or 4 persons in a family, 14% of households included more than five members (6–10 members). Thus, adverse impacts from the unemployment, especially for the heads of households who have to take care of other family members, would be stressful, as negative effects are not only on themselves but also on their family members who relied on them. In addition, family with fragile members (the elderly, the disable/sickness and children) encounter problems of lacking special care during the strict social distancing measures. Our survey data also found that during the lockdown, family members take care of the fragile group by themselves (59 percent), while 38 percent of the fragile group have no one taken care of. About half of them have 1–3 aging people to take care with, and 28 percent of them have 1–2 disable or sick to live with. These reflect that they may not be properly taken care of and may result in worsen health and quality of life in time of the crisis. In case that they are taken care of by family members during the shutdown period, it is likely that women have to take care of this unpaid burden, as reported in Ellingrud and Segel (2021)

In addition, their children cannot go to school during the lockdown and are mostly taken care by the family. About 71% of the children of these households survey were with parents when schools were closed; most of them cannot learn online (70%) mainly due to lack of equipment and income as well as lack of skill.

The vulnerable poor seemed to have multiple problems at the same time, not only the drop in economic status but also health-related problems or family members' problems. While the heads of households lost their jobs, many poor families had sick or handicapped members to care for, as well as children's educational expenses. Thus, the study asked respondents to evaluate their overall life problems and rank the level of their problems from low to higher. Levels of overall life problem evaluated can reflect all socioeconomic and psychological problems they have faced in this lockdown period. Figure 5 shows results as ranked by respondents.

Obviously, most respondents indicated medium to high levels of life problems, with about 50% and 41%, respectively. Thus, as our descriptive statistics on various indicators indicated, adverse impacts of COVID-19 on their life problems seem to be remarkable.

The results from changes in socioeconomic indicators discussed earlier show the channels of transmission of economic problems to social problems and psychological effects, adding on life problems. How they respond to these socioeconomic problems is also asked. The respondents said that they try to adjust themselves to survive in many ways, for example, many of them tried to spend less and live more economically to fit with the income reduction. Some who could not repay

Figure 5. Level of overall life problems affected by the COVID-19 situation.

Levels of Overall Life Problems Affected by COVID-19
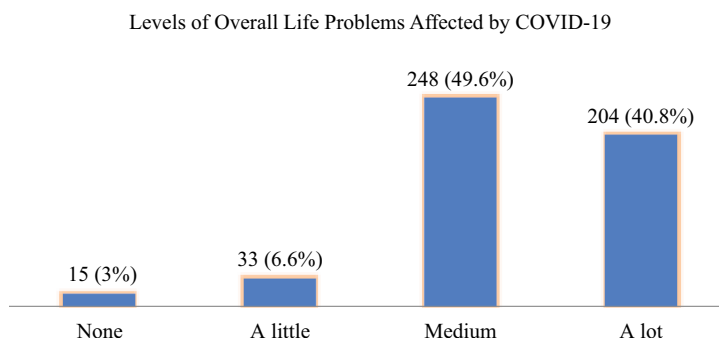
debt (which might have had high informal interest rates) asked relatives for assistance, sell properties, moved to new places or resided in temples temporarily; others become homeless. Some said that they prayed and applied Dhamma teaching to release tension, apart from listening to the news on what to do. Some relied on food donated by outsiders during the lockdown period, while many reported eating food at temples. During the lockdown, a policy from the Supreme Patriarch of Thailand requested that every temple with the capacity to distribute food to the vulnerable and the disadvantaged should provide free food. Moreover, free food provision from civil society and the private sector is also evident during the lockdown. This informal mechanism can help providing food security to a lot of vulnerable in times of crisis.

4.3. Assistance: effectiveness and problems

Initial government assistance measures across the board did not target the poor or the most highly affected areas. These measures were generally formal compensation programs for workers under social security schemes who were eligible to receive payments from unemployment insurance and from being laid off. Later, to reduce adverse impacts during the lockdown, these measures included money transfers to assist the unemployed who were informal workers. Three initial monthly allowances of 5,000 baht each were followed by a special payment: 3,000 baht for fragile groups such as the elderly, the disabled, women and those with small children. The selection process for the first program was through self-identification online. However, those who had difficulties in identifying themselves through the IT system (i.e., online registration via mobile phone) may not have been able to receive that assistance. The urban poor in slums faced problems such as lack of mobile phones to register, lack of access to the internet and lack of necessary skills. Many had not previously experienced this kind of registration process for assistance, and some registrations were rejected for unclear reasons. Moreover, some households in poor urban areas did not have an identification card or a household registration, so they were unable to identify themselves and could not receive government assistance. As Satayanurak (2020) noted, when urgent crisis assistance is required, the government should use a selection process that screens out the non-target group instead of screening a target group into the system, which is a more difficult and time-consuming process.

Because of the ineffectiveness of the government procedure to register to receive assistance at the early stage of the lockdown, the urban poor more relied on NGOs coming to their areas or homes to help or received assistance from the community members, friends and relatives. Informal assistance is important in the Thai society and in this case, seemed to reach the poor more easily than government remedial measures. The second government assistance measure, in which 3000 baht was provided to those in fragile groups from the Ministry of Social Development and Human Security, was delivered through a welfare card for the disadvantaged who were already in the system, so this process was less complicated and received fewer complaints. However, those who had not previously registered for a welfare card were not eligible to receive the payment. Some poor people complain that they are eligible for those welfare cards (i.e., having some kind of disabilities) but do not know why related officers cannot successfully enrol them into the system and provided them the card; therefore, they are not eligible to receive that assistance.

However, about 69% said that the government allowances assisted them for about 1–4 weeks. Thus, as the crisis lasted longer than the period of formal government assistance measures, informal assistance from other non-governmental sources was also important. In fact, informal safety nets always play a crucial role in Thailand in any time of crisis; for example, during 1997 economic and financial crisis in Thailand, informal safety nets from families and communities were crucial to cushion the unemployed from Bangkok who returned to their hometown in the countryside (Kittiprapas, 1999).

Figure 6. Sources of assistances during the COVID-19 outbreak situation.

Sources of Assistances most Received by the Respondents
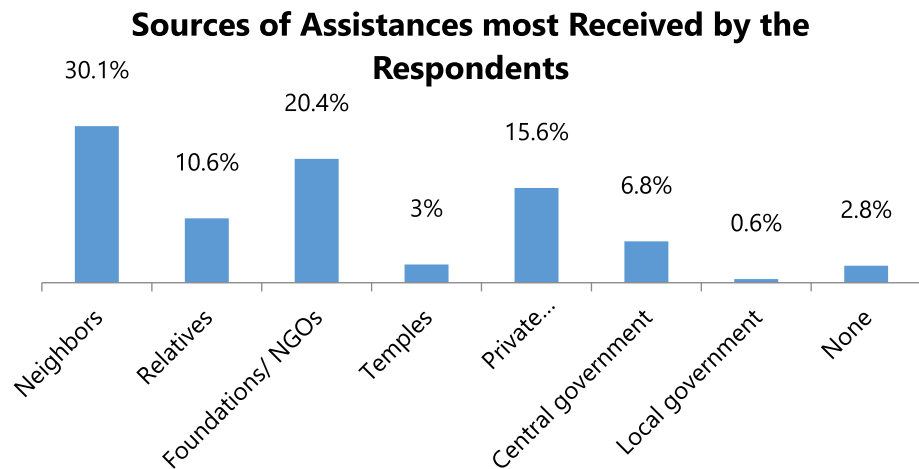
The survey found that most of theassistances reaching the respondents are from informal sources such as community members/neighbors, friends and relatives, NGOs, foundations or private organizations as well as temples, as shown in Figure 6.

From the survey, since the COVID-19 outbreak, the main assistances are from private sectors such as community members/neighbors (about 30%) and relatives (10.6%), followed by NGOs and private organizations (20.4% and 15.6%, respectively), which comes to donate foods and others at their places (without difficult registration processes). Religious organization such as temples also played their roles in remedy suffering by providing shelter and food (3%). Assistances from the government sector (both central and local) account for only 7.4%, as reported from the respondents. The data clearly reflect that the vulnerable still rely on informal general assistance from relatives and friends/neighbors, private sector and non-government organizations more than temporarily remedial measures from the government sector, which is consistent with findings in Josephson et al. (2021).

In summary, the COVID-19 pandemic with the need to implement lockdowns, physical distancing and other containment strategies had adverse impacts on the vulnerable in this study shown by these data. The strict control measures from the government to restrict COVID-19 transmission based on the priority of health concerns produced a trade-off, resulting in economic losses that, in turn, had adverse social and psychological effects on many lives more than those infected by the disease. In the next section, we used an empirical test to investigate the factors significantly affecting their overall life problems.

4.4. Empirical model result

This section will determine significant factors affecting overall life problem during the lockdown period. Reported levels of life problems in the ordinal scale were used as the dependent variable for the empirical test; therefore, order logit was employed. The results in Tables 9 show the relation of overall life problems to the independent variables of unemployment, increased debt, size of income reduction, status as the head of household, number of fragile family members (i.e., the elderly, the handicapped and sickness and children) and outside assistance.

Empirical results show that unemployment, income loss and sex (female) are significant factors that affect overall life problem with 95% confidence. Unemployment and income reduction during the COVID-19 lockdown situation significantly influenced overall life problems as this may result from the uncertainty about future employment and income insecurity. Sex, as female, is only one significantly demographic factor affecting life problem in this period and showing the highest

Table 9. Factors affecting the increase in overall life problem during the lockdown

N=500
LR chi(9)=28.67
Prob > chi 2= 0.0007
Log Likelihood = -484.73763 Pseudo R2 = 0.0287

Independent variable	Coef.	S.D.	P >|Z|
Sex	−.384925	.189875	0.043
Age	−.0942548	.1025258	0.358
Education	−.0564346	.0995752	0.571
Unemployment	.3816299	.1847836	0.039
Size of income loss	.0000724	.0000215	0.001
Increased debt burden	.0914428	.1089008	0.401
Being head of family	.3695517	.2060497	0.411
No. of fragile members in the family	.061225	.0556992	0.272
Outside assistance	−.037111	.0583916	0.525

coefficient (with −0.385) among significant factors. Perhaps, woman have a lot to worry and burden during this difficult period.

Although these results are from a cross-sectional study, there are other studies that indicate the theoretical relationship of independent and dependent variables in the long-term consequence; for example, rises in unemployment during large recessions can lead to a domino effect of reduced income, additional stress and unhealthy lifestyles and often affect life, as Sullivan and Wachter (2009) found that workers with larger losses in earnings tend to suffer greater increases in mortality. Those setbacks in income and health often shorten life expectancy. Thus, this implies that unemployment is crucial for life problem in the short and long term.

The significant effect of income loss to life problem is expected, similar to Laborde et al. (2020) indicating that the major impacts on poverty and food security during the pandemic are more likely to come from income shock. However, in this case study, the effect of income loss, an economic indicator, is relatively smaller than the effects of gender and unemployment on overall life problem.

Other international findings indicate similar impacts of these variables. For example, women tend to have more effects from this situation. Although COVID-19 has adverse impacts on unemployment for both men and women, the gender effects may be different in terms of magnitude and period. As a lot of women work on daily services for housing or offices, they tend to stop working during the lockdown. Similarly, many international studies witnessed the significant fall in women's labor force participation during the lockdown, in addition to the increased burden of unpaid care—shopping, cooking, cleaning and taking care of kids and parents in the household—which is disproportionately carried by women (Ellingrud & Segel, 2021). Data by Zarrilli and Luomaranta (2021) for UNCTAD indicate that even in countries where men's unemployment rate outpaced that of women, more women left the labor market entirely in 2020. Although many people discouraged by the pandemic may be withdrawn from the labor force, the female labor force participation dropped out more quickly, consistent with ILO findings that women's working hours dropped dramatically in 2020. The study explained that partly due to higher participation of women in the tourism sector, which has severely been affected. That can also explain the case of Thailand that highly relies on tourism absorbing a large number of informal workers. Apart from the drop in employment and working hours, taking care of children and other family members during that hard time is expected to cause more problems to women, leading to the increase in overall life problem. In fact, the empirical result in Table 8 shows that the

coefficient of sex is slightly higher than unemployment (.386 compared to .382), which may reflect the role of non-economic factors (such as overall life and family burden) more than economic factors (such as unemployment and income) to life problem. Moreover, international study, i.e., OECD/WHO (2020), indicates that since the outbreak of COVID-19, violence against women and girls, particularly domestic violence, has intensified; this is likely to indicate that there may also be some unopened aspects that also increased women's life problem in this period.

The increased debt burden during the lockdown period did not significantly affect the overall life problem, perhaps because this period was an atypical occurrence and some may receive a debt-break period during the lockdown as well as help from others, such as money, food and other necessary items. Although data show that there are some indebted persons increased during the lockdown, the numbers are small and the increase in debt is more obvious in post-lockdown as indicated in Table 3. Due to economic shutdown, they received assistance from a number of sources in the community and relied on donations for basic needs from outside organizations and free food from temples during that temporarily short period; this may be the reason why debt has not highly increased during the lockdown period when many assistances are provided. As a result, debt is not a significant factor, shown in the Table.

However, outside assistance is not significant, indicating little effect to release their life problem or the ineffectiveness in reaching the most vulnerable in time. For non-economic aspects in life, they usually consult family or community members or relied on religious teaching. As indicated in this study, the most effective assistances are likely to come from informal sources such as friend and community organizations rather than formal government assistance. Similarly, Josephson et al. (2021) found that low-income urban households in African countries significantly rely on friends and family to cope with shocks experienced since the outbreak of the pandemic. This reflects that the urban poor in slums rely more on non-government assistances, which are quicker to reach out to the vulnerable to their houses/communities and easier for them to access to, while formal government assistance involves some problematic process in registration and procedure, which are obstacles to help some of the needy in time.

Although this survey found many negative socioeconomic impacts stemming from the COVID-19 situation, some positive aspects were found as well. For instance, some participants learned how to adjust to spending less (being more economical) and attempted new occupations or work opportunities (i.e., some elderly wants to learn about using IT, some wants to be trained for producing artisans, food, agriculture, etc), as well as learned about sanitation and how to take care of themselves to avoid contracting COVID-19. Most of the respondents (99%) reported that they knew how to protect themselves from the virus transmission, such as wearing masks and washing hands often; 83% said that they took better care of sanitation than before the pandemic.

5. Conclusion and recommendations

COVID-19 has enormously influenced socioeconomic factors, as shown in this case study of Thailand's most vulnerable group in its most affected area. This study is among the forefront investigating impacts of COVID-19 in the Bangkok's urban slums, combining socioeconomic and demographic factors. The strict protective measures taken to control the pandemic have taken a large toll on economic and social concerns. As a result of the lockdown, the study found that the poverty rate sharply increased by 50 percentage points and unemployment due to COVID-19 affected 73% of the unemployed. They also experienced a larger income deficit, with less to spend for their daily basic needs, and increasing debt. The poorest, in the lowest income group and below the poverty line, had the highest ratio of expenditure to income and debt ratio to income. Adverse effects were worse during the lockdown period. However, after the lockdown period, these indicators of poverty and income continue to worsen compared to the pre-lockdown period; among our respondents, the number below the poverty line increases more than double

compared to the pre-lockdown period. Combined with high unemployment rates and other social impacts, these adverse effects can result in stress and an increase in overall life problems.

It is obviously seen from the empirical results that women as well as the unemployed and those with income loss tend to get more adverse effects in life problem during the lockdown. Specific assistances are needed, for instance, to reduce unpaid burden for women, such as providing child care or the elderly care assistances and private consultation services, and help them back to work. There are many suggestions to help women back to work, for example, promoting work-life flexibility for home paid workers, providing education support for the low-educated or upskills and reskill to fit the demand of future works, especially facing technological disruption.

As being unemployment is a main significant factor for increased life problem, policies should aim for increasing employment opportunities for this vulnerable group, including part-time basis with flexibility. Both the public and private sectors can help in providing areas for work and earning opportunities for these vulnerable, especially, women, the poor, the low-educated (unskilled) and the elderly. IT facilities and digital literacy should be provided.

In time of income loss, although they may receive some cash transfer from the government, that may not cover all their expenses and a longer period. Thus, government or public-private cooperation to open spaces for their earning is encouraged, for example, open safe public spaces for street vendors, hiring them to work in some public areas or in communities while some require trainings (i.e., working to improve local sanitation and quality of life of the fragile groups such as taken care of the elderly, children and the illness in the communities). With proper trainings to the unemployed in this period, some may have skills to work for the needy in their communities.

Descriptive data show that the magnitude of the impacts in post-lockdown is still high, indicating the consequence of the COVID-19 in the longer term. The changes in the economic indicators discussed in this article seem to indicate that it will be difficult for their standards of living to return to pre-COVID-19 levels any time soon. The economic slowdown is expected to extend to the long term, especially with the expectation of a second and following outbreaks and more restrictive control measures. Thus, the study suggests that governmental approaches should focus on increasing earning opportunities and employment for those in vulnerable economic groups both in times of the COVID outbreak and post-COVID in the long run.

Certainly, governmental assistance should meet basic needs in terms of food security, safe shelter, healthcare and basic costs of living, but a social and human development approach beyond standard basic welfare coverage is crucially needed. Policies should consider for a long-term approach rather than temporary cash transfer. Additional assistance can build up individuals' career opportunities by providing skills training or reskilling to work in this time of crisis and beyond. Digital preparedness for people in slums to access to digital infrastructure is also a priority as this can be an important tool for learning, working, earning and living in a future digital world.

Moreover, comprehensive assistances have to be provided to reduce life problems in terms of psychological well-being as people have an increasing stress level and assistance in physical care for the fragile groups in the community as well as community basic utilities for quality of life. Social protection policy should not only provide basic welfare coverage to the disadvantaged and the vulnerable but also to build up human resource and empower communities to be able to resilience with any crisis in the long run.

6. Study limitations
As this is a micro-case study focusing on the most socioeconomically vulnerable during the first lockdown measure in the second quarter of 2020, the survey data and related government measures were collected in the third quarter of 2020 and thus do not include any subsequent remedial mechanisms or control measures that might have occurred in response to the "second

and the following waves" of infections or additional outbreaks' situations after the study period. Also, a single question is used as a proxy of dependent variables.

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Appendix: Statistic tests of correlation and heteroskedasticity correlation test among independent variables

Correlation test among independent variables

```
. correlate UNEMPLOYED INDEBT HEADFAMILY INCOMELOSS FRAGILEMEMBER HELPING SEX AGE EDUCATION
(obs=500)

               UNEMPL~D   INDEBT HEADFA~Y INCOME~S FRAGIL~R  HELPING      SEX       AGE EDUCAT~N

  UNEMPLOYED    1.0000
      INDEBT    0.0041   1.0000
  HEADFAMILY   -0.0266   0.0407   1.0000
  INCOMELOSS   -0.0538   0.1099  -0.0310   1.0000
 FRAGILEMEM~R  -0.0464   0.0334  -0.1007   0.0484   1.0000
     HELPING   -0.0740   0.0650   0.1002   0.0177   0.0322   1.0000
         SEX    0.0371   0.1262   0.0858  -0.0040  -0.0858   0.0002   1.0000
         AGE   -0.0447  -0.2821   0.0750  -0.0415   0.0653   0.0934  -0.1200   1.0000
   EDUCATION   -0.0202   0.1969  -0.0429   0.1052   0.0273  -0.0375   0.1003  -0.4286   1.0000
```

Heteroskedasticity

Heteroskedasticity

```
. estat imtest, white

White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(51)     =      55.77
        Prob > chi2  =      0.3002

Cameron & Trivedi's decomposition of IM-test
```
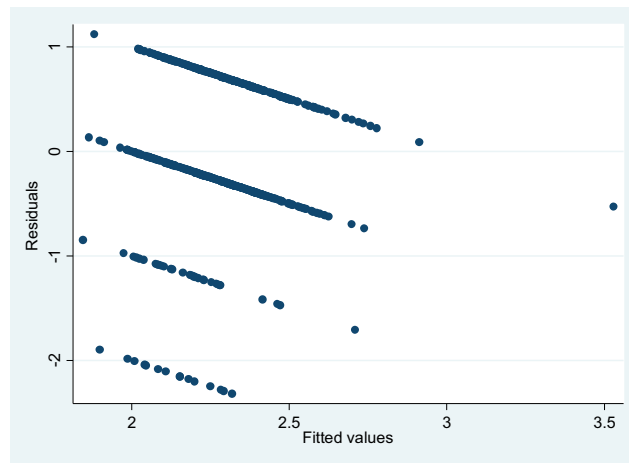
Source	chi2	df	p
Heteroskedasticity	55.77	51	0.3002
Skewness	33.54	9	0.0001
Kurtosis	7.57	1	0.0059
Total	96.88	61	0.0024

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of PROBLEM

        chi2(1)      =      19.84
        Prob > chi2  =      0.0000

.
```

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