"The Covid-19 pandemic and livelihood vulnerabilities of people in urban areas of Vietnam"

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THE COVID-19 PANDEMIC AND LIVELIHOOD VULNERABILITIES OF PEOPLE IN URBAN AREAS OF VIETNAM

Abstract

This study was carried out to examine the livelihood vulnerabilities encountered by residents in Vietnam's urban areas during the emergence of the Covid-19 pandemic. People's vulnerabilities are approached in terms of employment and income vulnerabilities. The study compares the changes in income and employment of residents in Vietnam's urban regions during the outbreak of Covid-19 and after the epidemic which is gradually controlled to determine the livelihood losses that people in urban areas face. Data for the study were collected from 206 families in Vietnam's urban areas that were directly affected by the epidemic. The multivariate regression method is used to evaluate people's vulnerability during epidemic outbreaks. According to the findings of the study, the income disparity between the outbreak of the Covid-19 pandemic and the end of the epidemic is fairly considerable (about VND 7.6189 million/month). The multivariate regression model's results reveal that the degree of government assistance provided during the epidemic time has the greatest positive impact on people's income and quality of life (Standardized Coefficients = 0.584), whereas people's unemployment during the pandemic outbreak period has a negative impact, causing damage to people's income (Standardized Coefficients = -0.395). The study will recommend new livelihood strategies for residents in the context of Vietnam's "new normal" based on the findings of the investigation.

Keywords income, employment, adaptive capacity, livelihood strategies, unemployment, government support

JEL Classification D10, O10, R10, R20

INTRODUCTION

The Covid-19 pandemic, which spread across countries, has had fairly observable effects on everyone living in society as well as on the "health of the economy." The impacts of the Covid-19 pandemic on people's livelihoods cover urban to rural areas of the countries and territories where the COVID-19 pandemic broke out and hit. The Covid-19 pandemic's growing waves have had a devastating influence on employment, social security, and income of people in countries all over the world (Anggita et al., 2021; Bamweyana et al., 2020; Tran et al., 2020).

There have been studies that support the hypothesis that the Covid-19 pandemic has had a detrimental impact on countries' economies; it affects industries and sectors, particularly the service sector (Pattiruhu & Paais, 2020; Tan & Tran, 2020; Obrenovic et al., 2020; Shen et al., 2020). These studies looked at the impact of the Covid-19 pandemic on the entire economy. The Covid-19 pandemic is still affecting the economy of Vietnam, as well as employment and income. According to GSO statistics (GSO, 2022a; GSO, 2022b), the Covid-19 pandemic damaged more than 16.9 million people in Vietnam who were 15 years of age or older in the first quarter of 2022. Out of a total of more than 16.9 million people neg-



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atively impacted by the pandemic, 0.9 million people lost their jobs, accounting for about 1.2%; 5.1 million people had to take a break/suspend from production and business, accounting for about 6.7%; 5.7 million people have their working hours cut or forced to take time off work, take rotational leave, accounting for about 7.6%, and 13.7 million workers have their income reduced, accounting for about 18.3%. The two largest urban areas in Vietnam, the Red River Delta and the Southeast, are still the two regions with a higher proportion of workers affected than other regions. In these two regions, there were 25.7% and 23.9%, respectively, of workers who claimed the pandemic had a negative impact on their jobs. Statistical results of GSO (2022a) also show that urban areas are still areas with more workers suffering than rural areas: 25.8% of workers in urban areas are negatively affected by the Covid-19 pandemic, while this rate in rural areas is 20.5%.

According to GSO data, unemployment is an unavoidable result of the Covid-19 pandemic's influence on urban workers (GSO, 2022a; GSO, 2021a). The youth unemployment rate in metropolitan areas is around 9.3 percent, with certain major cities in Vietnam having relatively high rates, specifically, the youth unemployment rate in Ho Chi Minh City in the first quarter of 2022 is about 11.30%, and the youth unemployment rate in Hanoi is about 10.31%.

Rising unemployment and falling incomes in Vietnam, in general, and in urban areas in particular, are clear manifestations of the Covid-19 pandemic's negative effects. The effects of the Covid-19 pandemic on residents appear to be more severe in urban areas (GSO, 2022a; Anggita et al., 2021; Bhagat et al., 2020). The Covid-19 pandemic has caused significant damage to people's livelihoods; people have suffered physical and mental damage, a decrease in income, job loss, and a physical impact on people's health (Guo et al., 2020).

The impacts of the Covid-19 epidemic on people's lives are reasonably evident; however, inhabitants in Vietnam's urban regions appear to be more impacted by the pandemic. The study will analyze the livelihood risks faced by individuals in the urban areas during the emergence of the Covid-19 pandemic.

1. LITERATURE REVIEW AND HYPOTHESES

The Covid-19 pandemic affects various aspects of socio-economic life around the world; scientists take varied approaches when evaluating the impact of the Covid-19 epidemic on the economy, livelihoods, income, and social security throughout the world (Pattiruhu & Paais, 2020; Huynh et al., 2021; Obrenovic et al., 2020; ILO, 2020; Stephany et al., 2020). The economic vulnerabilities that individuals confronted during the Covid-19 pandemic have been a matter of concern and analysis from different perspectives and approaches to specific problems (Nelson et al., 2010; Nelson et al., 2005).

For livelihood vulnerabilities of people during the outbreak of the Covid-19 pandemic, when considering the income aspect, the impact of the Covid-19 pandemic has decreased people's earnings, and the fall in income is considered by using different calculation and quantification methods, such as dividing income into sources and calculating the decrease in people's income-generating sources. People's sourc-

es of income may be split into salary, stable monthly income, and other earnings (Included are earnings from investments and part-time jobs other than steady monthly employment.) The change in people's income is compared between the periods before and after the Covid-19 pandemic to determine the income losses caused by the Covid-19 pandemic (Qian & Fan, 2020; Paul et al., 2021; Dao et al., 2022; Suratman et al., 2021). The data utilized in the study when approaching from the perspective of calculating people's livelihood vulnerability during the outbreak of the pandemic is collected from households affected by the Covid-19 epidemic.

People's livelihood vulnerabilities during the Covid-19 epidemic outbreak, when evaluating the damages in terms of individuals' employment, residents in the context of the Covid-19 pandemic outbreak, have suffered severe damages such as job loss and restricted working hours (Bamweyana et al., 2020; Buheji et al., 2020; Huynh et al., 2021; Nguyen & Tran, 2021). When jobs are affected, people's lives also lead to consequences related to the quality of life, people's incomes are reduced as a result of job

loss, people's physical and mental lives will also be affected, and pressures form and affect people's quality of life.

The livelihood vulnerabilities of residents studied and calculated in previous studies are largely based on sustainable livelihoods analysis framework (DFID, 1999), which is based on the calculation of livelihood vulnerability from different livelihood resources in order to consider people's ability to respond to shocks (L. Le & T. Le, 2020; Tu et al., 2015; Tu et al., 2012; Jansen et al., 2006). All studies have identified shocks as a negative element impacting people's adaptive capacity, and they will suffer the damage caused by such negative shocks (Bury, 2004; Adger et al., 2001).

The Covid-19 pandemic has had diverse degrees of influence on people's lives; different methodologies and calculations have been used in past studies to quantify the impact of the Covid-19 pandemic on people's lives. Within the scope of this study, the research team focuses on the group of individuals most affected by the Covid-19 pandemic based on the statistical results of GSO (2022a) that is, persons living in urban regions of Vietnam. The research subjects were chosen from a group of people in urban areas of Vietnam who are directly affected by the Covid-19 pandemic (as measured by statistics on Covid-19 infections and received government assistance for those affected by the Covid-19 pandemic) to consider the distinct influence of the Covid-19 pandemic on this target group.

The study will be carried out with a target group of individuals in Vietnam's urban regions to compare the amount of impact of the Covid-19 pandemic on people via the damages that the people suffer. The study analyzes the changes in livelihood vulnerability via the scale impacting people's income and employment in urban areas in the setting of the onset of the Covid-19 pandemic and after Vietnam moved to the policy of "Living safely with Covid-19." The fluctuations and adaptation in people's livelihoods will serve as a foundation for providing new livelihood strategies in the new setting, safely adapting to the new Covid-19 context of the entire economy.

The research hypotheses presented by the research team to achieve the study objectives are as follows:

- H1: Urban residents' incomes suffered when the Covid-19 pandemic broke out.
- H2: People in urban areas are affected to different degrees by the various elements of their income in the context of the Covid-19 pandemic.

2. METHODS

2.1. Data collection methods

The data for the study are gathered from a survey of families in urban regions of Vietnam affected by the Covid-19 pandemic based on The GSO Survet (GSO, 2021b). Households impacted by the Covid-19 pandemic must fully meet two requirements:

- First, there is a member of the family infected with Covid-19.
- Second, the households chosen for the survey must receive government subsidies under the government's program.

These households will be statistically recorded by the statistics bureau of urban areas. Selecting the appropriate households to represent those affected by the pandemic will help the study analyze the most complete and accurate extent to which the Covid-19 pandemic has impacted people's lives, from there, it will be possible to calculate the livelihood vulnerability of these people.

The survey was carried out in three major cities in Vietnam, which are also three cities representing three regions of Vietnam and were the cities most heavily affected by the waves of the Covid-19 pandemic.

The first urban: Hanoi, the capital city of Vietnam. This is the representative urban area of the North of Vietnam.

The second urban: Da Nang City. This is the urban representative of the Central region of Vietnam.

The third urban: Ho Chi Minh City. This is the representative urban area of the South of Vietnam. All three cities have experienced the largest periods of lockdown and social distancing in Vietnam. The physical, mental, and livelihood vulnerabilities of people are clearly typical for Vietnam during the outbreak of the Covid-19 pandemic. At the same time, they are the major cities in Vietnam, as well as the places with the quickest economic recovery. As a result, the calculation and analysis of people's vulnerability and adaptation capability in these urban areas will be clearer than in other parts of Vietnam.

According to Nguyen (2014), the minimum number of observations required to perform statistical operations is 100. To get the required minimum number of observations, 300 questionnaires were sent to 100 families in three cities. The research team collected 273 questionnaires out of a total of 300 distributed. The research team completed data entry with 67 questionnaires that did not match the standards owing to a lack of survey information, and the research team removed these questionnaires from the data. The remaining number of survey questions is 206, with these 206 questionnaires satisfying the information criteria and the minimal number of observations; hence, these 206 observations were utilized to perform the statistical operations necessary to achieve the study objectives.

The survey was executed from March 15, 2022 until April 25, 2022. This is also the transition period in policies to respond to the Covid-19 pandemic in Vietnam.

2.2. Data analysis method

To analyze the livelihood vulnerabilities faced by residents in urban areas in the context of the Covid-19 pandemic, the research team divided livelihood vulnerabilities into groups for analysis:

- Firstly, with the livelihood vulnerabilities when examined in terms of employment. The research team will describe the livelihood vulnerabilities that people face using employment and unemployment scales.
- Secondly, the livelihood vulnerabilities will be examined from the viewpoint of incomes, as livelihood vulnerabilities will be analyzed through scales that affect the income of surveyed households.

Specifically, the scales include the following measures (see Table 1).

Table 1. Variables of the model

Variable name Notation		Explanation	The basis for variable selection				
	Dependent variable						
Income	Υ	The total amount of money earned by surveyed families in one month. Income is calculated in units of millions of VND/month.	Bezerra et al. (2020); Dao et al. (2022); Qian and Fan (2020); Tuyen and Huong (2014)				
		Independent variable					
Education level	X1	This is the scale used to indicate the interviewee's level of education. The higher the degree of education, the higher the projected earnings of the research subject. The following levels of education are coded: High school, college, university, and postgraduate.	Tuyen and Huong (2014); Dao et al. (2022); Qian and Fan (2020); Paul et al. (2021); Bhagat et al. (2020)				
Age	X2	The age scale is a scale that assesses the survey subject's real age. The study's age factored in working age and had an effect on income as well as illness resistance in the context of the Covid-19 pandemic.	Paul et al. (2021); Huynh and Mai (2011); Guo et al. (2020)				
Work experience	Х3	Work experience is used to calculate the number of years respondents have worked in similar roles; the longer the projected work experience, the higher the income.	Tuyen (2013); Dao et al. (2022); Nguyen and Bui (2011); Stephany et al. (2020)				
Government Subsidies	X4	The government subsidy is the government's financial assistance to families affected by Covid-19. These grants will be a one-time payment based on the actual amount received by the family.	Paul et al. (2021); Bhagat et al. (2020); Nguyen and Tran (2021)				
Number of family members infected with Covid-19	X5	This scale is used to calculate the number of members per household surveyed who were infected during the Covid-19 outbreak.	White and Van (2020); Bezerra et al. (2020); Guo et al. (2020); Bamweyana et al. (2020)				
Number of unemployed people	X6	The number of family members who lost their jobs during the outbreak of the Covid-19 pandemic.	Paul et al. (2021); Dao et al. (2022); Bhagat et al. (2020)				
Gender of the surveyed subjects	X7	Used to assess the impact of the pandemic on respondents' earnings and employment.	Le et al. (2020); Dao et al. (2022)				

The study will focus on analyzing the influence of several factors on the income of the research respondents in order to identify the livelihood vulnerabilities that they face, such as government assistance, unemployment, work experience, and the number of family members infected with Covid-19. These are the scales that have a direct influence and reflect the livelihood vulnerabilities experienced by the study subjects.

3. RESULTS

3.1. Vulnerabilities of people's livelihoods in urban areas in terms of employment

People in urban areas were particularly hard hit by shortened working hours, temporary layoffs (temporary unemployment) owing to production and business establishments, and enterprises that cannot function during a period of social distancing. According to the survey results, the number of members of the surveyed families affected by job loss or affected by employment to varying degrees is shown in Table 2.

Table 2. Vulnerabilities of livelihood to employment

Criteria	Quantity	Rate (%)
1. Reduction of working hours	12	5.83
2. Totally losing a job	72	34.95
3. Vacation with minimum wage	53	25.73
4. Unpaid leave	69	33.50

Vietnam's economic fields and sectors have all been badly impacted during the period of social distancing, particularly the service industry in urban regions. Businesses, production facilities, and industrial spaces must close down; enterprises must attempt to maintain the operations of their parts, which will employ a variety of strategies to preserve their operational expenses. The decisions made by employers will have a direct impact on employees at the businesses that are the focus of this study.

The study's survey results revealed that, in the context of the Covid-19 pandemic that broke out in urban areas, the surveyed residents were greatly affected; specifically, people who are affected

by reduced working hours account for approximately 5.83% of the surveyed subjects affected by working hours, but this is also the mildest impact that the survey subjects face. A portion of the survey respondents lost their employment totally; these subjects will need to find new occupations after the epidemic has been controlled; this proportion accounts for around 34.95% of the questioned people. These subjects frequently fall into the group working for the service sector or private firms, businesses, and employers frequently proclaim their shutdown, resulting in people losing their job completely.

In terms of work, damage occurs when people temporarily quit their jobs during a period of social distancing and is entitled to the minimum pay under the employer's requirements; this group accounts for around 25.73% of those polled. The minimum wage in Vietnam is 1.4 million VND/person/month. When individuals receive this minimal salary, their lives are exceedingly tough, since it is insufficient to cover the family's living expenditures; typically, unseen life constraints will have a bad mental influence on people's lives.

A part of people will lose their jobs temporarily, but when employers return to work, employees will keep working. Employees in this category are not entitled to wages while on leave; this is a mutual arrangement between the employee and the company. This category accounts for around 33.5% of survey respondents.

Employment damages have had a detrimental influence on people's lives; as a result, some individuals have chosen quick fixes in this tough moment, such as self-employment, switching to an internet company, and making financial investments to address their life's troubles in this new environment. These are also new ways of earning a living that people might employ in a variety of ways.

3.2. Livelihood vulnerabilities when evaluating people's income

When people's jobs are affected, people's incomes will also be affected, specifically: When the Covid-19 pandemic broke out, people's incomes decreased significantly; the difference in people's monthly income between the period of

Table 3. Comparison of income and expenditure difference

			Paired difference	es				
Items	Mean	Std. deviation	Std. error mean		nce interval of fference	t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 Y_B - Y_A	-7.6189	7.5771	.5279	-8.6598	-6.5781	-14.432	205	.000
Pair 2 CP_B – CP_A	-2.8898	1.7059	.1189	-3.1241	-2.6555	-24.314	205	.000

the Covid-19 pandemic when people experienced job losses and the period after the disease's outbreak was controlled and people returned to their "new normal" lives is relatively large. According to the findings of the study, the income disparity is approximately VND 7.6189 million each month. Research findings also support the view of Dao et al. (2022), and Quian and Fan (2020) in indicating that the advent of the pandemic has impacted the salaries of workers and residents in different fields.

When income is inconsistent, individuals prefer to cut back on frivolous purchases and only spend money on necessities, the loss of income has an adverse effect on how much money families spend. As the epidemic was brought under control, life gradually stabilized, people's income categories increased, and household spending became "easing"; the gap in expenditure between the outbreak and post-pandemic periods is fairly considerable, at around 2.8898 million VND/month.

It is necessary to explore the influence level of various factors on people's earnings. First, examine the research model's fit (see Table 4).

About 77.4% of the dependent variable is explained by the independent variables; the research model is appropriate. The following outcomes are obtained from the estimated regression parameters (see Table 6).

People's income is affected by numerous factors, including positive and negative factors. The factors that positively affect income during this period are the government subsidies for families that have trouble and are impacted by the Covid-19 pandemic, the effects include people's injuries due to Covid-19 infection, individuals losing their employment, or being temporarily jobless. This subsidy has a significant influence on people's lives, particularly when individuals suffer challenges as a result of income losses; this subsidy will assist people in reducing their troubles in life. According to the calculated data, the coefficient of the effect of this variable on income is around 0.584. This also represents the true meaning of government assistance in the difficult background that people encounter when their earnings are reduced. The study's data analysis findings completely agree with Paul et al. (2021), and Stephany et al. (2020) when they point out that the assistance from the government, charities, and authorities during a tough time of the people due to the influence of the epidemic has a positive effect on people's lives and helps them better adapt and stabilize their lives in that challenging environment.

Table 4. Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.884ª	.782	.774	3.4271

Note: a. Predictors: (Constant), X1, X2, X3, X4, X5, X6, X7.

Table 5. ANOVA

	Model	Sum of squares	Df	Mean square	F	Sig.
	Regression	8345.583	7	1192.226	101.510	.000 ^b
1	Residual	2325.493	198	11.745		
	Total	10671.077	205			

Note: a. Dependent variable: Y; b. Predictors: (Constant), X1, X2, X3, X4, X5, X6, X7.

Table 6. Coefficients^a

	Model	Unstandardize	ed Coefficients	Standardized Coefficients	Т	Sig.
_		В	Std. Error	Beta		
	(Constant)	20.480	3.196		6.408	.000
	X 4	4.146	.378	.584	10.964	.000
	X 2	847	.085	-1.043	-9.913	.000
4	X 7	-5.074	1.948	319	-2.605	.010
1	X 1	4.004	1.275	.193	3.141	.002
	X 3	1.420	.188	.465	7.564	.000
	X 5	-1.577	1.015	099	-1.554	.122
	X 6	-2.596	.375	395	-6.917	.000

Note: a. Dependent variable: Y.

Other factors that have a positive impact on people's income include work experience (beta coefficient = 0.465), which shows that having working experience is an advantage to ensure job maintenance for people during the Covid-19 pandemic, and the ability to recover after the epidemic is under control is also better. The findings support the views of previous studies when Tuyen (2013) and Dao et al. (2022) showed that work experience contributes positively to employees' income, especially when the difficulties caused by the epidemic are increasing and maintaining jobs is very important. With prior experience in similar positions, it will be easier to maintain a job, therefore maintaining a steady income and being capable of stabilizing the lives of the study subjects.

Having a good education level also has a positive impact on people's income during this period with the beta coefficient estimated at 0.193. The research findings back up the assertions made by Paul et al. (2021), Bhagat et al. (2020), and Dao et al. (2022) that there is a positive correlation between education level and income level. Indeed, all researchers concur that being competent and well-trained would assist workers in the employer earn higher wages, allowing them to cope with life, stabilize their livelihoods, and adapt better than those who are unable to keep their employment.

Besides the factors that have a positive impact on people's income, people's income losses are also affected by many different factors, such as unemployment; the survey results also show that when the epidemic broke out, people's jobs were cut, resulting in a significant reduction in people's incomes. The beta coefficient of the unemployment variable in the study is estimated to be around –0.395, showing that the damage caused to people's income is very large. The study's findings fully concur with Dao et al. (2022) and Le et al. (2020) who believe that unemployment is an unavoidable effect of an event (in this case, an outbreak of disease) because unemployment directly affects the income of the research subjects, causing damage to the lives of people in general and the survey subjects in particular. These are also the most severe effects caused by shocks to people's lives and livelihoods.

Furthermore, the fact that individuals are infected with Covid-19 has had a significant detrimental influence on both the physical and mental health of people, as well as their incapacity to work and the effects of health on people's income. The beta coefficient of this variable is estimated to be around –0.99. The results of the study support the perspectives of Bamweyana et al. (2020) and White and Van (2020). The epidemic's negative consequences have a direct influence on people's health and lives.

According to research findings, the negative effects of the Covid-19 pandemic do great damage to people's lives, particularly in terms of work and income. Having those vulnerabilities forces people to develop strategies to adapt to the "new normal" environment when governments have policies to adapt to the new situation, overcome, and progressively "recover" the economy during the illness epidemic.

The study employed and quantified the association of the sex variables (scale *X*7) of the surveyed people but did not focus on studying the influence of gender on the vulnerability and adaptability of the survey participants in the research setting; therefore, this scale will not be analyzed.

The findings from testing the research hypotheses demonstrate that when the pandemic breaks out, the income of people in urban areas suffers substantially. Furthermore, employment, job experience, unemployment, and education level all have varying degrees of influence on people's income in urban regions.

4. DISCUSSION

The "new normal" is being implemented and applied in nations; though the number of Covid-19 cases stays high, people are progressively adapting to living with the pandemic and securely adjusting to the new circumstances. The economies of countries are also being reactivated to ensure that they can recover compared to the period before the outbreak of the Covid-19 pandemic. In Vietnam, when production and business activities gradually recover, employment and income damages are also gradually reduced. However, in order to adapt safely and guarantee livelihoods for themselves and their families, people require new livelihood plans. The research team offered the following recommendations.

People must use government assistance in programs such as training or low-interest business loans to shift livelihood strategies when their employment has not been returned to 100% of the working hours and their income from conventional occupations is still uncertain. The change of new livelihood strategies can be expressed through the following contents: People can use government subsidies to carry out business activities or make investments to generate other sources of income. Furthermore, learning to develop a professional ability to prepare for work is one of the possibilities available to individuals to satisfy job criteria in the current setting of ever deeper integration in Vietnam.

People who lost their jobs during the epidemic's breakout must adjust to the new context; when the new production and business activities gradually return, choosing and obtaining new positions will become considerably more difficult. As a result, people will have more suitable employment options in the present "new normal" time if they have more flexibility in picking occupations and using assistance tools from government support channels.

CONCLUSIONS

The outbreak of the disease has affected the lives of all people in countries not only for people in urban areas but also for people in other areas. However, those in urban areas appear to be more affected than those in rural regions in Vietnam. The findings of the research have focused on those living in urban areas. Additionally, studies have shown that the epidemic has a negative impact on urban residents. People in urban areas suffer from employment and income losses, and income falls during the disease's spread, resulting in severe repercussions on people's spending and lives. People were helped in part by the government's assistance policies when the epidemic struck. To adapt to the new context, people need new livelihood strategies to ensure a stable and satisfying life in the context of the new normal in Vietnam in the current period.

The research outcomes have achieved the objectives set out in the paper when analyzing the vulnerabilities of people in urban areas when the epidemic broke out. However, the paper is still limited when only focusing on analyzing the difficulties and damage to people who are directly affected by the Covid-19 pandemic (households with a member infected with Covid-19); whereas when the epidemic broke out in Vietnam's urban areas, social distancing affects all residents in urban areas. The paper will be more comprehensive if it compares the effects of the pandemic on two groups of people in urban areas: families whose members are infected with Covid-19 and those without. This is also the study team's next research direction when assessing the impacts on these two groups of subjects, simultaneously, there is a comparison between the two times when the epidemic broke out and after the epidemic broke out in each target group.

AUTHOR CONTRIBUTIONS

Data curation: Thanh Thuy Cu. Investigation: Thanh Thuy Cu. Methodology: Tuan Anh Nguyen.

Resources: Thanh Thuy Cu, Tuan Anh Nguyen. Software: Thanh Thuy Cu, Tuan Anh Nguyen.

Writing – original draft: Thanh Thuy Cu, Tuan Anh Nguyen. Writing – review & editing: Thanh Thuy Cu, Tuan Anh Nguyen.

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