Interests and Knowledge of the People on Non-Pharmaceutical Measures - DMHTT of Thailand During the Third Wave of the COVID-19 Pandemic

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ABSTRACT

Research on "Interests and Knowledge of the people on non-pharmaceutical measures - DMHTT of Thailand during the third wave of the COVID-19 pandemic." The study aims to explore the knowledge, interests and practices of the people using data from Google Trend from searching with relevant keywords and then systematizing the data with words in a data mining program to find the spatial correlation of important measures with the Covid-19 epidemic situation in each region of Thailand. The results shows that Interest and behavior in response to non-pharmaceutical measures – DMHTT in Thailand was significantly correlated with the severity of the outbreak.

1. INTRODUCTION

Non-pharmaceutical or non-pharmaceutical intervention measures Interventions are the most effective public health measures for managing, preventing, and controlling the spread of SARS-CoV-2 in the communities that will cause the COVID-19 outbreak. Not only does it provide a moment for all countries to deal with epidemics without a vaccine to help control the outbreak, but also to prevent and control disease at a time when the health sciences have developed a vaccine. Such measures are still important to make effective control of this emerging disease more successful. The ECDC (ECDC, 2020) points out that non-pharmaceutical measures play an important role in reducing transmission rates and the impact of COVID-19 in the European Union, the European Economic Area and the United Kingdom. Until a safe and effective vaccine is available for everyone at risk of severe COVID-19, non-pharmaceutical measures will remain the primary public health tool against SARS-CoV-2.

Understanding of how the COVID-19 pandemic related to social distancing efforts to contain future outbreaks and to mitigate some of the lockdowns it is essential. Khataee et al. (2021) studied the quantitative relationship between key variables characterizing the epidemiological characteristics of COVID-19. and social distancing efforts of nine European countries The study found that the epidemic was strongly correlated with the size of the reduction in people's movement. This made it possible to clearly decipher the relative impact of the timing and extent of social distancing on the total mortality burden of the pandemic. Meanwhile, Kim et al. (2021) demonstrated the effectiveness of social distancing in South Korea's spreading disease control, finding that the higher the level of social distancing, the higher the proportion of the effect. Negative respiratory viral PCR testing is also elevated, suggesting that national social distancing measures can help reduce the spread of common respiratory viral infections during the Covid-19 epidemic effectively.

Another personal measure that countries all over the world encourage people to take is hand washing. Li et al. (2021) reviewed six of the relevant research studies from four countries. In a total of 5,178 eligible databases and references, mask wearing was associated with a significantly reduced risk of SARS-CoV-2 infection (OR=0.38, 95% CI: 0.21-0.69, I2= 54.1%)

for healthcare workers, it was found that masks reduce the risk of infection by almost 70 percent. For Thailand in early 2021, the Department of Disease Control, Ministry of Public Health has asked all citizens to cooperate to "Keep your guard up" even in the process of gradual vaccination against COVID-19 People still have a chance of getting infected. Therefore, the importance of self-protection measures should be strictly adhered to by wearing a mask 100%, washing hands frequently, keeping distance and avoiding entering community or crowded places, including risky places to prevent infecting and infecting family members and reduce the spread of disease in the community as well

Department of Disease Control asks people to cooperate with the principle of "D-M-H-T-T" to protect themselves; D: Social Distancing Maintain a distance of 1-2 meters, avoid being in crowded places M: Mask Wearing Wear a cloth mask or hygienic mask at all times H: Hand Washing Wash your hands often with soap and water. or alcohol gel T: Testing, temperature measurement and T: Thai Cha Na, scan Thai Chana application before entering and leaving public places every time to make information easier to coordinate.

Based on the aforementioned policies, this research aims to explore the knowledge, interests and behavior of the people by using data from Google Trend from searching with relevant keywords and then organizing the data to find the spatial relationship of important measures to the epidemic situation of COVID-19 in each region of Thailand.

2. METHODOLOGY

2.1 Data Management

This research used data from keyword-driven google trend search results using keywords related to non-pharmaceutical interventions in accordance with guidelines recommended by the Ministry of Public Health for delaying progression. epidemic of covid-19

The Coronavirus Disease 2019 Epidemic Situation Administration has issued a notification to the provincial governor, provincial public health office doctors, and the provincial infectious disease committee asking all citizens to comply with DMHTT measures, including Distancing, Mask. wearing, hand washing, testing and inviting people to use the application "Thai wins" by adding 7 more words related to social distancing, mask wearing and hand washing that the World Health Organization has designated as an important measure. These are 3 words corresponding to Social distancing: Distancing, Isolation and Quarantine, 2 words corresponding to Mask wearing, Surgical mask and Mask, and 3 words corresponding to Hand washing: Hygiene, Alcohol and Bleach.

2.2 Method of Data Analysis

Spatial analysis of data to show distribution of popularity of COVID-19 epidemic prevention knowledge research using descriptive statistics. The spatial correlation model of knowledge obtained from public search related to the COVID-19 outbreak was analyzed using Geographically weighted regression Analysis by sorting Explanatory Variables and Dependent Variables by province for a total of 77 provinces as shown in Table 2 below.

Table 1. Systematization of data for GWR analysis.

	Variable I	Variable II	Variable III	Variable IV
Explanatory Variables	AVG Distancing	AVG Mask wear	AVG Hand wash	AVG Total
Dependent Variables	The number of cases in the first period	The number of cases in the second period	The number of cases in the third period	
Number of Cases	77 provinces			

3. RESULT AND DISCUSSION

3.1 Properties of statistical distributions

On average, people in each province of Thailand had 418 searches for knowledge about self-protection against the COVID-19 outbreak, with a median of 396 and a baseline of 227 in the past 12 months. Phuket had the most searches at 809 times, followed by Bangkok at 770, and people in Yasothon province the least, only 177 times.

Table 2. Properties of statistical distributions.

MEAN	418	MAXIMUM	809
MODE	227	MINIMUM	177
MEDIAN	397	STD	127.3787075
		SKEWNESS	0.776320985

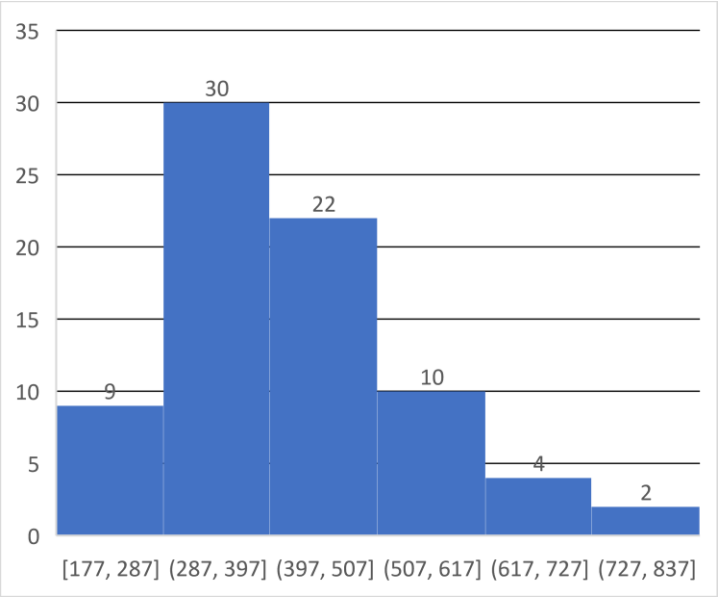

Figure 1. Distribution of the frequency of knowledge searching according to NPI of Thai people in each province.

3.2 Spatial relationship model parameters

Correlation analysis between the mean of keyword searches. These included four words of social distancing, three words of mask wearing, four words of hand washing, and the average of all keyword searches (AVG Total) and the number of confirmed cases during the first wave of outbreaks, the second wave, and the third wave of the outbreak. The study found that the mean of the total number of search queries (AVG Total) correlated with the level of the COVID-19 outbreak, with values of R2 = 0.383, 0.021 and 0.474, respectively.

Table 3. Properties of statistical distributions.

	The 1st Pandemic	The 2nd Pandemic	The 3th Pandemic
Bandwidth	2.879858	137.950868	2.813133
Residual Squares	2702209.332	186704849.9	14280243232
Effective Number	10.595343	2.006451	10.892975
Sigma	201.725233	1577.850477	14697.51778
AICs	1045.278114	1356.847422	1705.944049
R2	0.383345	0.021099	0.473759
R2Adjusted	0.29424	0.007962	0.395007

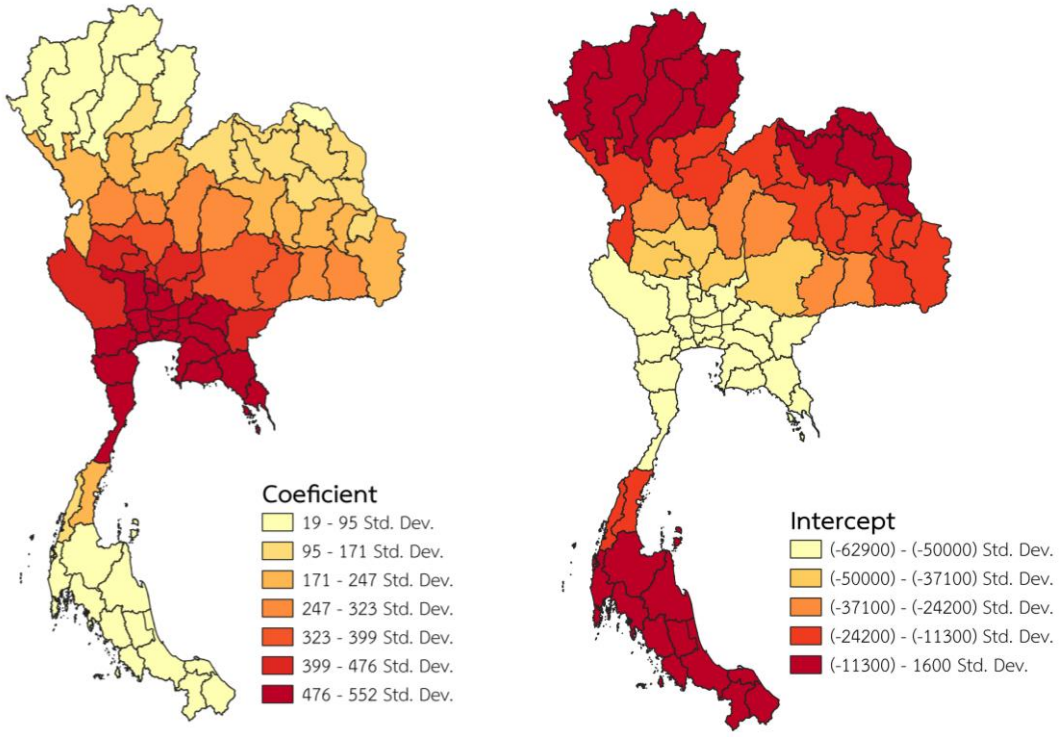

Figure 2. A map showing the spatial distribution of Explanatory variables' Influence towards Dependent variable through the two parameters: local coefficients and local intercepts.

The results of the GWR analysis were presented to show the importance of search in each province. It was found that there was a very high rational correlation in the central region, especially the provinces surrounding Bangkok, including the eastern region and the upper southern region as shown in the map in Figure 2.

4. Conclusion

A search of provincial residents' correlation with the level of infection within the province was evident during the third wave of outbreaks, with a correlation coefficient of 47.38 percent. The correlation between the first wave was 38.33 percent, while the second wave was only 2.11 percent correlation. People are more interested in searching for knowledge from the Internet for self-defense. The search data has a geographic relationship with distribution in the central, eastern and upper southern regions, which are areas with relatively high outbreaks of COVID-19.

5. REFERENCES

Khataee, Hamid., Scheuring, Istvan., Czirok, Andras., and Neufeld, Zoltan. (2021). "Effects of social distancing on the spreading of COVID-19 inferred from mobile phone data." *Nature: Scientific Report*. 11(1661) (January) doi.org/10.1038/s41598-021-81308-2

Liu, Yang., Morgenstern, Christian., Kelly, James., Lowe, Rachel., and Jit, Mark. (2021). "The impact of non-pharmaceutical interventions on SARS-CoV-2 transmission across 130 countries and territories." *BMC Medicine*. Vol 19, Number 40 (February). doi.org/10.1186/s12916-020-01872-8.

Patiño-Lugo, Daniel F., Vélez, Marcela., Salazar, Pamela Velásquez., Vera-Giraldo, Claudia Yaneth., Vélez, Viviana., Marín, Isabel Cristin., Ramírez, Paola Andrea., Quintero, Sebastián Pemberthy., Martínez, Esteban Castrillón., Higuita, Daniel Andrés Pineda., and Henandez, Gilma. (2020). "Non-pharmaceutical interventions for containment, mitigation and suppression of COVID-19 infection." *Colombia Medica*. vol. 51, no. 2. (April). doi.org/10.25100/cm.v51i2.4266

Rundle, Chandler W., Presley, Colby L., Militello, Michelle., Barber, Cara., Powell, Douglas L., Jacob, Sharon E., Atwater, Amber Reck., Watsky, Kalman L., Yu, Jiade., and Dunnick, Cory A. (2020). "Hand hygiene during COVID-19: Recommendations from the American Contact Dermatitis Society." *Journal of American Academic Dermatol*. 83(6) (December): pp.1730-1737. doi: 10.1016/j.jaad.2020.07.057.

Li, Yanni., Liang, Mingming., Gao, Liang., Ahmed, Mubashir Ayaz., Uy, John Patrick., Cheng, Ce., Zhou, Qin., and Sun, Chenyu. (2021). "Face masks to prevent transmission of COVID-19: A systematic review and meta-analysis." *Am J Infect Control*. 49(7) (July): pp.900-906. doi: 10.1016/j.ajic.2020.12.007.