

The incidence of COVID-19 along the Thai-Cambodian border using Geographic Information System(GIS), Sa Kaeo Province, Thailand

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Abstract:- This is a survey study. The study's aim was to explore the incidence of COVID-19 along the Thai-Cambodian border (Sa Kaeo Province). The study relies on secondary research-related data on institutions linked with the Ministry of Public Health. The study was conducted within Thailand's Sa Kaeo Province. The study relied on data on the number of COVID-19 patients and the epidemic situation in all districts of Sa Kaeo Province throughout five waves. The data in this study was examined using frequency, percentage, mean, and standard deviation, as well as a Geographic Information System (GIS) program.

The studies indicated that Sa Kaeo province is at high risk of contracting COVID-19. More than 1,000 cases have been recorded in Watthana Nakhon and Khok Sung districts. The districts of Muang Sa Kaeo, Khao Chakan, and Aranyaprathet were next, with 501-1,000 cases. The districts of Wang Nam Yen, Wang Somboon, Khlong Hat, and Ta Phraya had the fewest occurrences (less than 500). The people who are more probably to contract COVID-19. More than 1,000 cases were reported in Wang Nam Yen, WatthanaNakhon, and Aranyaprathet districts (1,832 cases, 1,415 cases, and 1,042 cases, respectively). MuangSaKaeo, KhaoChakan, Khlong Hat, Khok Sung, and Ta Phraya districts were next, with 501-1,000 cases. While the Wang Somboon district had the lowest number of incidents (less than 500). COVID-19 patients were being isolated at home in Sa Kaeo Province, according to the investigation. More than 2,000 cases have been verified in WatthanaNakhon, Wang Nam Yen, and Khok Sung districts (3,105 cases, 2,413 cases, and 2,139 cases, respectively). MuangSaKaeo, KhaoChakan, and Aranyaprathet districts were next, each with 1,000-2,000 cases. The districts of Wang Somboon, Khlong Hat, and Ta Phraya had the fewest incidences (less than 500). As a result, an early and efficient COVID-19 surveillance, control, and prevention policy and guidelines are necessary. Establish a border screening system that is efficient and has a sufficient number of specialists to handle it. In the event of an uncontrolled COVID-19 pandemic, strong policies such as border closures among both Thailand and Cambodia are implemented in accordance with epidemiological or WHO recommendations.

Keywords:- COVID-19, Thai-Cambodian border, Geographic Information Systems (GIS), Thailand.

I. INTRODUCTION

The SARS-CoV-2 virus that causes Coronavirus disease (COVID-19). The majority of those infected with the virus will develop mild to moderate respiratory disease and will recover without the need for specific treatment. Some patients will get critically ill and require immediate treatment. The elderly and those with underlying medical illnesses such as cardiovascular disease, diabetes, chronic respiratory disease, or cancer are at a higher risk of developing serious illness. Anyone of any age can become quite ill or die as a result of COVID-19 (WHO, 2022)[1].

Thailand's border areas are vulnerable to the COVID-19 spread. There have been indications of smuggling along the Thailand-Cambodia border in Aranyaprathet district, Sa Kaeo province, that is still occurring on the Thai border. As a result, economic regions in border areas may become sites of COVID-19 transmission, and substantial action should be taken to handle the problem. Aranyaprathet district, Sa Kaeo province, one of the economic zones on the Thai-Cambodian border, is being scrutinized and questioned by the people's sector. Despite the government's announcements of strong monitoring and intense security, secret information was discovered in hidden locations, canals, and natural channels. There are still significant gaps in cross-border smuggling between the two nations. The people's network that moves and communicates to raise awareness of COVID-19's impact. The network shows awareness of border commerce routes, but if there are patients during the coronavirus epidemic, the quality of life for the entire country may suffer [2]. The COVID-19 Information Center reported on the situation of the novel coronavirus disease (COVID-19) with the most recent information found on March 7, 65, in Thailand, finding 21,162 new cases. Domestic infections and travel accounted for 21,060 cases. There were 102 people from other countries, for a total of 3,047,857 cases. The highest number of deaths in 2022 was 65, out of a total of 23,300 deaths. This necessitates surveillance of border areas such as Sa Kaeo. That there were more people smuggled into the country with the infection was found.[3]

II. METHOD

This is a survey study. The study's aim was to explore the incidence of COVID-19 along the Thai-Cambodian border (Sa Kaeo Province). The border is a high-risk location for the spread of COVID-19, although it is remote and has multiple paths for easily traveling across the country. Border screening can bring extremely low positive predictive values

as well as extremely high expenses per relevant case found.[4] Specific vulnerabilities of populations living near borders needed to be determined, as might the risk of long-term social and political effects of inefficient border management policies made during the epidemic.[5] The study relied on secondary research-related data on Ministry of Public Health-affiliated organizations. The study was conducted in Thailand's Sa Kaeo Province. The study relied on data on the number of COVID-19 cases and the epidemic situation of five waves in all districts of Sa Kaeo Province. The frequency, percentage, mean, and standard deviation and a GIS application were used to examine the data in this study.

III. RESULT

Thailand's Sa Kaeo province is located in the country's eastern region. It is now the province with the most territory in the east and one of the border provinces with the most trade. Sa Kaeo province is a melting pot of multi-ethnic people who have immigrated to the area. The majority of

Khmer immigrants in Sa Kaeo dwell in Aranyaprathet district. Aranyaprathet district is home to the majority of Vietnamese immigrants in Sa Kaeo province. There are several Lao ethnic groups, such as Thai Yonok or Lao Phung Dam, a Lanna ethnic group that originally inhabited Wang Nam Yen district. As a result, it is a border location where people continuously cross borders and risk transmitting COVID-19.

Table 1 represents the situation of the Covid-19 at-risk groupings in Sa Kaeo Province, with the unidentified risk group having the greatest number, 32,190 (66.2%). Return from Bangkok and the surrounding areas, cross the Thai-Cambodian border and Arriving from a COVID-19-infected country, followed (12.0, 11.0 and 6.1 %, respectively). While People exposed to COVID-19 had the fewest (4.4%). However, the number of people traveling across the Thai-Cambodian border, although smaller in number, is still at risk of spreading COVID-19.

no	Risk group	number	Percentage(%)
1	Cross the Thai-Cambodian border	5,493	11.0
2	People exposed to COVID-19	2,146	4.4
3	Return from Bangkok and the surrounding areas.	5,839	12.0
4	Arriving from a COVID-19-infected country	2,946	6.1
5	Other risk groups	32,190	66.2

Table 1: COVID-19 risk group, Sa Kaeo Province

The results showed the populations at high risk of contracting COVID-19, Sa Kaeo province. More than 1,000 cases were reported in WatthanaNakhon district, and Khok Sung districts (1,690 and 1,822 cases, respectively). MuangSaKaeo district, KhaoChakan district, and Aranyaprathet district followed, with 501-1,000 cases. While Wang Nam Yen district, Wang Somboon district, Khlong Hat district, and Ta Phraya district had the fewest instances (less than 500), as indicated in figure 1.

The findings revealed populations at greater risk for developing COVID-19 in Sa Kaeo Province. More than 1,000 cases were reported in Wang Nam Yen district, WatthanaNakhon district, and Aranyaprathet district (1,832 cases, 1,415 cases, and 1,042 cases, respectively).

MuangSaKaeo district, KhaoChakan district, Khlong Hat district, Khok Sung district, and Ta Phraya district followed, with 501-1,000 cases. While Wang Somboon district had the fewest instances (less than 500), as indicated in figure 2.

The study found that COVID-19 patients were being quarantined at home in Sa Kaeo Province. More than 2,000 cases were reported in WatthanaNakhon district, Wang Nam Yen district, and Khok Sung district (3,105 cases, 2,413 cases, and 2,139 cases, respectively). MuangSaKaeo district, KhaoChakan district, and Aranyaprathet district followed, with 1,001-2,000 cases. While Wang Somboon district, Khlong Hat district, and Ta Phraya district had the fewest instances (less than 500), as indicated in figure 3.

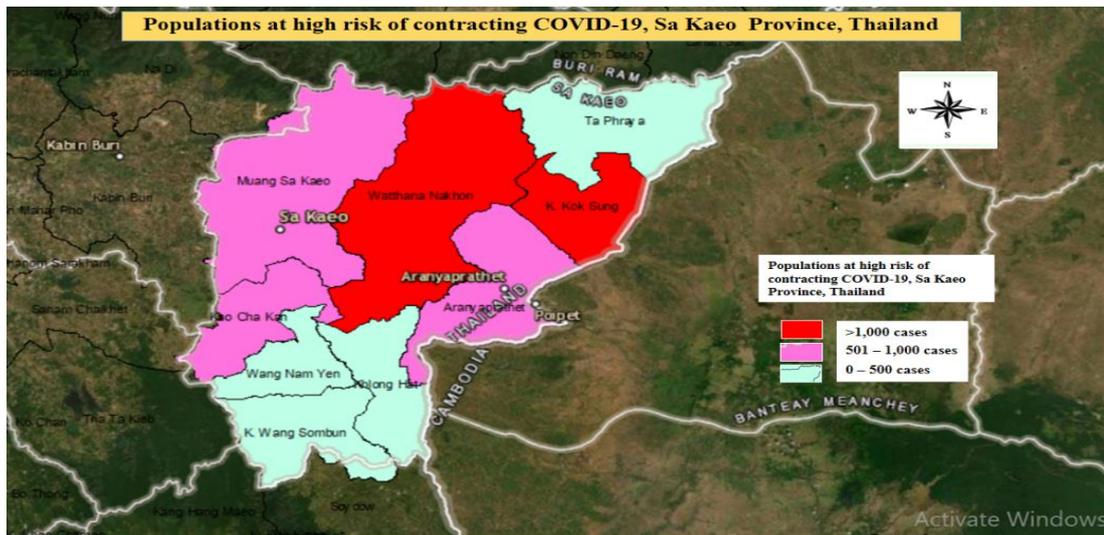


Fig. 1: The populations at high risk of contracting COVID-19, Sa Kaeo province.

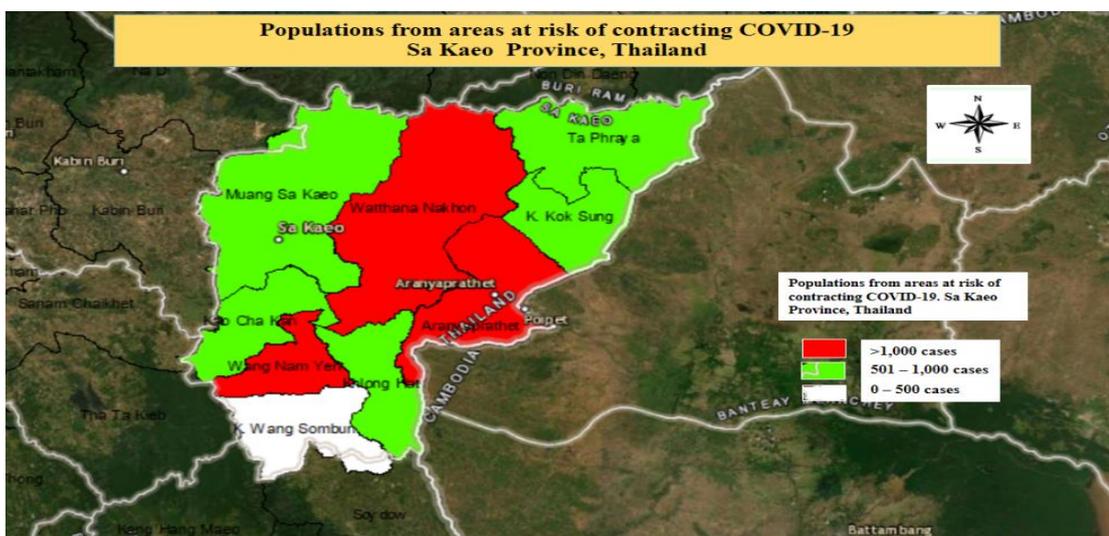


Fig. 2: Populations from areas at risk of contracting COVID-19, Sa Kaeo Province, Thailand

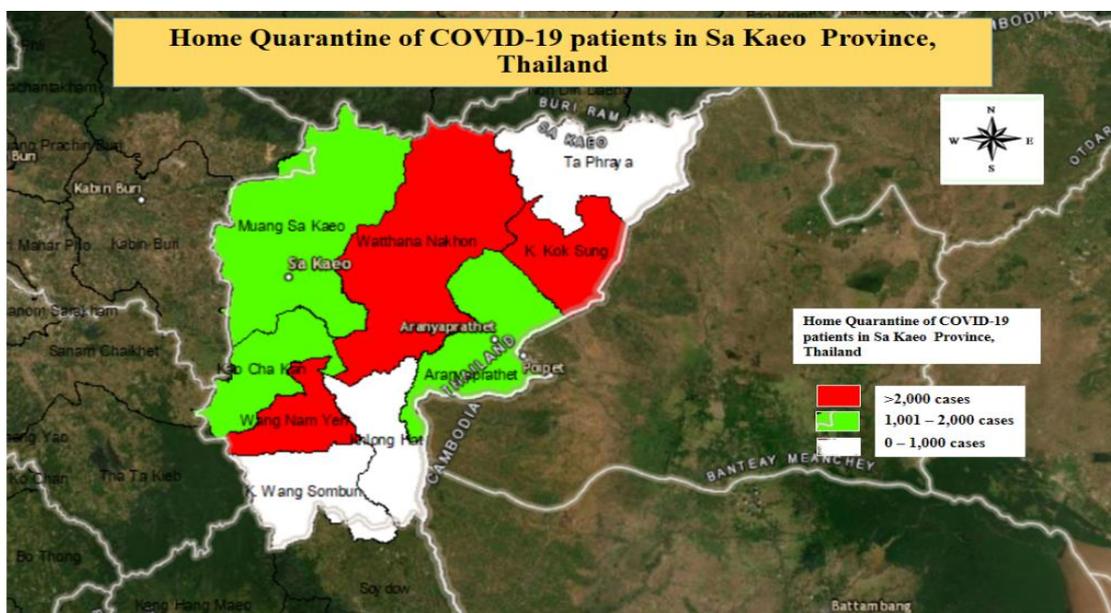


Fig. 3: Home Quarantine of COVID-19 patients in Sa Kaeo Province

IV. CONCLUSION AND DISCUSSION

The conclusions of the research indicated that, Sa Kaeo province has the biggest land in the east and is one of the most commercially active border provinces. It is a multi-ethnic melting pot of people who have come to the region. Aranyaprathet district is home to the majority of Khmer and Vietnamese immigrants. There are several Lao ethnic groups, including Thai Yonok and Lao Phung Dam, a Lanna ethnic group that originally inhabited the Wang Nam Yen area. As a result, it is a border area where people cross borders on a regular basis and risk transmitting COVID-19. This is consistent with the study's findings, which revealed that border employees are more likely to be exposed to a significant number of cross-border infections that are difficult to manage thoroughly.[6]

The findings revealed that Sa Kaeo province has a significant risk of getting COVID-19. More than 1,000 cases have been reported in the districts of Watthana Nakhon and Khok Sung. Muang SaKaeo, Khao Chakan, and Aranyaprathet districts were next, with 501-1,000 cases each. While Wang Nam Yen, Wang Somboon, Khlong Hat, and Ta Phraya districts had the fewest occurrences (less than 500). The populations that are most likely to contract COVID-19. More than 1,000 instances have been recorded in the districts of Wang Nam Yen, WatthanaNakhon, and Aranyaprathet (1,832 cases, 1,415 cases, and 1,042 cases, respectively). MuangSaKaeo district, KhaoChakan district, Khlong Hat district, Khok Sung district, and Ta Phraya district were next, with 501-1,000 cases each. While the Wang Somboon district had the fewest incidences (less than 500). The investigation discovered that COVID-19 patients were being isolated at home in Sa Kaeo Province. More than 2,000 instances have been confirmed in the districts of WatthanaNakhon, Wang Nam Yen, and Khok Sung (3,105 cases, 2,413 cases, and 2,139 cases, respectively). MuangSaKaeo district, KhaoChakan district, and Aranyaprathet district were next, with 1,001-2,000 cases each. While Wang Somboon, Khlong Hat, and Ta Phraya districts had the fewest incidents (less than 500). As a result, a timely and effective policy and guidelines for COVID-19 surveillance, control, and prevention are required. Establish a screening system for people who cross borders that is efficient and has enough professionals to operate it. In the situation of an uncontrolled COVID-19 epidemic, strict policies such as closing the Thai-Cambodian border are enacted in accordance with epidemiological or WHO recommendations.

This is consistent with the study's findings, which revealed that the COVID-19 pandemic has prompted a slew of border controls in regions across the world in an effort to stop the disease's spread. These events have slowed progress toward economic unification in Africa.[7] Borders are being reactivated as part of a campaign to limit the viral infection, which securitizes daily life well beyond the traditional border locations. The focus is on numerous potential consequences of this process, including more limitations on immigration and mobility, heightened regionalism politics, and an extension of spatial monitoring and surveillance.[8] Prior to the initiation of COVID-19, inter-village and cross-

border immigration was frequent. Following the first imported incidents, cross-border travel lessened. As during state lockdown, and cross-border travel was primarily restricted to short journeys. After the lockdown was lifted, human movement was almost back to normal.[9] Border controls and short border closures to prevent the spread of the coronavirus are a major cause of stress for border citizens. As well as migrants who occupy shared places with their workplace, friends, and family on both sides of the border. [10]

Sa Kaeo province continues to enforce full surveillance measures for COVID-19 on the border side. Legal border crossings must go through a surveillance system for everyone. The military and government's illegal cross-border smuggling measures have been rigorously implemented. Checkpoints have been set up on the route in and out of the city at several points. Focus on vans and cars carrying illegal foreign workers in accordance with measures to prevent the spread of the coronavirus disease 2019, or COVID-19.

The Ministry of Public Health, together with relevant agencies, has taken lessons from the past COVID-19 outbreak in order to reduce the risks for people from the epidemic and health hazards that arise. A public health emergency response plan is being drill, which will allow personnel from various sectors to understand their role and respond appropriately and quickly to the situation. This aims to enhance cooperation to exchange information on disease reporting between border areas, not only for COVID-19, but also for other potentially dangerous communicable diseases in the future. However, the participation of people and all sectors is essential. In addition, modern technology is being used to boost the efficiency of COVID-19 surveillance, control, and prevention.

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