

## Visits to the Emergency Department during the 2020 COVID-19 Outbreak in Thailand

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**Background:** The emergency department (ED) can be thought of as the “front door” to the 2019 coronavirus (COVID-19) pandemic. However, there have yet been no studies conducted examining ED patients in this situation.

**Objective:** To determine the numbers of ED visits by level urgency during the COVID-19 pandemic.

**Materials and Methods:** This was a cross-sectional study. The sample consisted of patients who presented at the Srinagarind Hospital ED from January 13 to April 21, 2020 (the date of the first confirmed case of COVID-19 in Thailand according to the Ministry of Public Health and day 100). We compared these data with those from the same period over the past three years.

**Results:** In 2020, the total number of ED visits was 13,263, with a mean patient age of 50.14±6.40 years. Over half of these patients (56.2%; n = 7,467) were female. Most visits (50.6%) occurred between 4.00 PM to 0.00 AM (afternoon shift). The majority of were walk-ins (84.2%) and ESI 3 (non-urgent; 79.9%). The average numbers of ESI 3 patients who visited the ED over the same period in 2017 to 2020 were 152.3, 171.5, 153.0 and 105.9 per day, respectively ( $p<0.001$ ).

**Conclusion:** During the COVID-19 pandemic, the number of ED visits, specifically those of ESI 3 patients, was significantly lower than during the same period in previous years.

**Keywords:** COVID-19, Emergency departments, Pandemics, Triage

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The 2019 coronavirus pandemic<sup>(1,2)</sup> (novel coronavirus 2019, 2019-nCoV, COVID-19) began with cases of pneumonia in China in 2019 and continues to the present<sup>(3-5)</sup>. The disease is originally thought to have been passed from animals to humans. Epidemiological studies have since revealed human-to-human transmission, both in China and in other areas around the world. The World Health Organization (WHO) announced the pandemic in March 2020, affecting public health services<sup>(6,7)</sup>.

The emergency department (ED) can be thought of as the “front door” to the pandemic response<sup>(8,9)</sup>. In theory, panic during the initial stages of the pandemic<sup>(10)</sup> should lead to increases in ED visits by patients at all severity levels, causing shortages of staff and resources. The government has implemented various policies in order to curb the spread of

the disease, and has been promoting social distancing and refraining from interprovincial travel. As a result, the number of non-urgent patients has decreased<sup>(11-13)</sup>. A study in England found that ED visits decreased by 25% during the week after lockdown (March 23 to 29) from 120,356 to 89,584 and 49% from the last week of February (24 February to 1 March), in which there were 177,370 visits<sup>(14)</sup>. However, there have yet been no studies regarding ED visits in Thailand during the COVID-19 pandemic. This study was thus conducted to gather this data.

### Materials and Methods

This was a cross-sectional study. The sample consisted of patients who presented at the ED at Khon Kaen University's Srinagarind Hospital from January 13 to April 21, 2020 (the date of the first confirmed case of COVID-19 in Thailand according to the Ministry of Public Health and day 100). We compared these data with those from the same period over the past three years. Patients who were triaged by doctors or nurses at the triage point were categorized to 3 levels according to the emergency severity index (ESI): (1) resuscitation required (ESI 1), (2) urgent (ESI 2), and (3) non-urgent (ESI 3). Patients who were transferred or referred from other hospitals were excluded. Ethical approval was provided by the Khon Kaen University Ethics Committee for Human Research (HE631204).

The sample size was calculated based on the

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number of ED visits during normal times. In order to achieve a significance level of 5% and power of test of 0.8, we determined that a sample size of 2,180 would be required. Statistical analysis was performed using SPSS for Windows version 16.0 (SPSS Inc., Chicago, IL, USA). Categorical data were presented as percentages, and continuous data were presented using mean and standard deviation. Univariable analysis was performed using a two-sample t-test for numerical data and a Pearson's correlation for data relationships between the two groups.

## Results

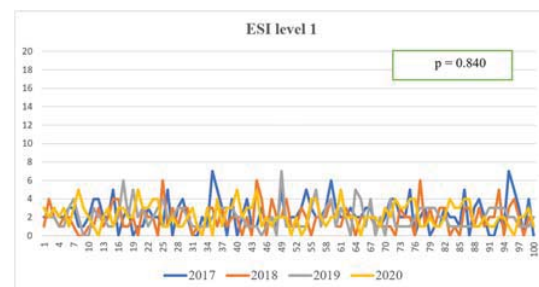
Over the 100-day period of the study, there were 13,263 visits to the ED. The mean age of the patients was  $50.14 \pm 6.40$  years, and 56.2% ( $n = 7,467$ ) were female. Most visits (50.6%) occurred between 4.00 PM to 0.00 AM (afternoon shift). The majority of patients were walk-ins (84.2%) and ESI 3 (non-urgent; 79.9%; Table 1).

The average numbers of ESI level 1 patients who visited the ED over the same period in 2017, 2018, 2019, and 2020 were 2.3, 1.9, 2.0, and 2.2 per day, respectively ( $p = 0.840$ ), as shown in Figure 1. The average numbers of ESI level 2 patients who visited the ED over the same period in 2017 to 2020 were 20.7, 23.3, 24.5, and 24.4 per day, respectively ( $p = 0.752$ ), as shown in Figure 2. The average numbers of ESI level 3 patients who visited the ED over the same period in 2017 to 2020 were 152.3, 171.5, 153.0, and 105.9 per day, respectively ( $p < 0.001$ ), as shown in Figure 3.

## Discussion

In the present study, we examined data from ED

patients who visited room January 13 to April 21, 2020 (the date of the first confirmed case of COVID-19 in Thailand according to the Ministry of Public Health and day 100), and compared them with those from the same period over the past three years. The number of ED visits decreased by 27.8% in 2020, likely due to social distancing being practiced in response to the COVID-19 pandemic. This finding was consistent with those of a study from England<sup>(14)</sup> and is supported by the fact that this decrease was found only in ESI level 3 (non-urgent) patients. The numbers of visits by ESI level 1 (resuscitation required) and level 2 (urgent) patients in 2020 did not differ from those in the past three years. This indicates that patients with mild symptoms were opting to remain at home, possibly treating their symptoms with over-the-counter medications, in order to reduce their risk of COVID-19 infection.

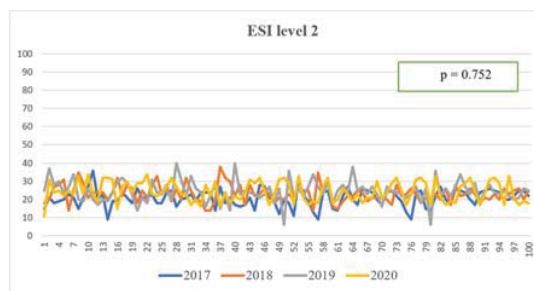


**Figure 1.** ESI level 1 resuscitation patients visited in 4 years.

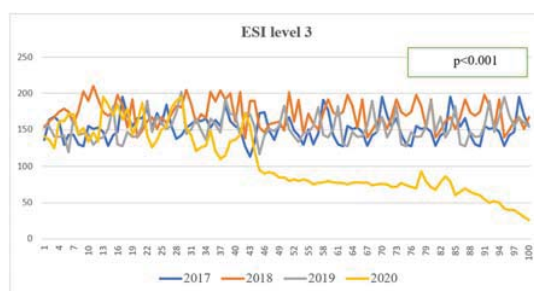
**Table 1.** Characteristics of patients during the first 100-days of the COVID-19 pandemic

	2017	2018	2019	2020	p-value
Number of visited (times)	17,529	19,670	17,960	13,263	
Sex: female (%)	9,220 (52.6)	10,504 (53.4)	10,201 (56.8)	7,467 (56.2)	
Age (years) mean $\pm$ SD	52.32 $\pm$ 8.40	50.16 $\pm$ 7.62	48.60 $\pm$ 8.20	50.14 $\pm$ 6.40	
Time of visit (times, %)					0.026*
Morning shift	7,221 (41.2)	7,907 (40.2)	7,292 (40.6)	4,324 (32.6)	
Afternoon shift	7,923 (45.2)	8,773 (44.6)	7,615 (42.4)	6,711 (50.6)	
Night shift	2,385 (13.6)	2,990 (15.2)	3,053 (17.0)	2,228 (16.8)	
Mode of arrival (times, %)					0.010*
Walk-in	15,986 (91.2)	18,116 (92.1)	16,182 (90.1)	11,167 (84.2)	
EMS	1,244 (7.1)	1,338 (6.8)	1,311 (7.3)	1,870 (14.1)	
Other	299 (1.7)	216 (1.1)	467 (2.6)	226 (1.7)	
ESI (times, %)					0.004*
Level 1 resuscitation	230 (1.3)	188 (1.0)	203 (1.1)	221 (1.7)	
Level 2 urgent	2,074 (11.8)	2,325 (11.8)	2,453 (13.7)	2,443 (18.4)	
Level 3 non-urgent	15,225 (86.9)	17,157 (87.2)	15,304 (85.2)	10,599 (79.9)	

\* Statistical significance



**Figure 2.** ESI level 2 urgency patients visited in 4 years.



**Figure 3.** ESI level 3 non-urgency patients visited in 4 years.

This decrease begins to become apparent in early March, at which point there were approximately 100 patients infected with COVID-19 in Thailand. During this same period, the Khon Kaen provincial governor issued recommendations to work from home, reduce travel, and practice physical distancing.

The COVID-19 pandemic is the first to affect Thailand to such a great extent over the past century. One consequence of this was that patients with non-urgent conditions were less likely to visit the emergency room. Such data will be useful in ED management during future outbreaks.

This study was limited in that it did not collect data of patients with fever or mild respiratory symptoms due to the establishment of an acute respiratory infection clinic to manage such cases. In addition, the study design was retrospective, which may have resulted in incomplete data collection<sup>(15-19)</sup>.

## Conclusion

During the COVID-19 pandemic, the number of ED visits, specifically those of ESI level 3 (non-urgent) patients, decreased significantly compared to those over same period in the past three years.

## What is already known on this topic?

The 2019 coronavirus pandemic began with cases

of pneumonia in China in 2019 and continues to the present.

## What this study adds?

The number of ED visits by ESI level 3 (non-urgent) patients decreased significantly in 2020.

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## Conflicts of interest

The authors declare no conflict of interest.

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