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One-month Progress of COVID-19 Cases in East Kalimantan, Indonesia

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Abstract

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BACKGROUND: East Kalimantan, Indonesia, will play a significant geopolitical role as the province has been selected as the location of the future capital city of Indonesia. As a buffer zone to the capital city, there is urgent attention on the preparedness of the cities and regencies in East Kalimantan to respond to emergent infectious disease events such as coronavirus disease-19 (COVID-19).
AIM: The aim of the present study was to descriptively convey information about COVID-19 cases in East Kalimantan during the period of March 18, 2020–April 18, 2020, in terms of the isolation, testing, and tracing mechanisms used.
METHODS: The initial distribution of COVID-19 was identified in 5 of 10 districts and is now present in almost all districts except for one very remote regency.
RESULTS: The tracing performance of the fast response teams in East Kalimantan during this period was considered satisfactory with a mean of 0.7% of people under observation testing positive for severe acute respiratory syndrome coronavirus 2, and a mean of 14.4% patients under investigations testing positive. The use of rapid tests since March 30, 2020 has improved the detection ability, with confirmed positive cases as a percentage of confirmed negatives increasing from 20.2% to 31.8%. The use of the COVID-19 rapid test was cross-checked with a dengue rapid test to prevent false-positive identification. Confirmed clusters were announced to the public, urging people to respond and report.
CONCLUSION: The 1-month progress of COVID-19 cases in East Kalimantan showed a total case fatality rate (CFR) of 1.85%, a closed CFR of 8.3% and a closed case recovery rate of 91.7%.

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Introduction

Coronavirus disease 2019 (COVID-19), a disease which causes by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) started as reported cases of respiratory illnesses from Wuhan, China by the end of 2019 and eventually spread all over the world in the following months, which forced World Health Organization (WHO) to declare it as pandemic by March 11, 2020 [1], [2]. To curb the spread of SARS-CoV-2, many countries implemented several measures such as limiting to closing border movements, community-wide isolation, and preventing the gathering of people [3], [4], [5].

Indonesia officially confirmed its first COVID-19 case on March 02, 2020. In the announcement by the President of the Republic of Indonesia, the first cluster was identified as a dance class [6]. In this cluster, 13 people were later positively identified as COVID-19 cases [7]. Three major activities which occurred between February 26, 2020 and February 28, 2020 were identified as clusters of COVID-19 transmission: The Seminar *Sinode* Bogor, Seminar *Anti Riba* Bogor, and Seminar *Kerohanian* Lembang [8]. Participants in these events came from all regions of Indonesia,

including East Kalimantan. On March 18–20, 2020, East Kalimantan confirmed nine COVID-19 patients, the majority of them coming from the two main clusters: The Seminar *Sinode* Bogor, Indonesia and Seminar *Anti Riba* Bogor, Indonesia. There was a confirmed positive patient from another cluster, the General Election Commission meeting in Jakarta [9].

East Kalimantan has been selected as the location for the new capital of the Republic of Indonesia [10]. Consequently, the flow of people in and out of East Kalimantan has increased rapidly. Despite this, health-care facilities in East Kalimantan are still limited compared to similar facilities on the island of Java. For this reason, the spread of COVID-19 needs special attention, given the nature of rapid transmission and the need for significant intensive care unit facilities [11]. Management of infectious diseases such as COVID-19 requires special arrangements such as negative pressure isolation rooms, personal protective equipment with a level three biosafety standard, and ventilators to help critical patients [12]. Therefore, the provincial government set several measures in place to flatten the curve of the COVID-19 infection rate and to prevent health services from being overloaded.

Recording the events surrounding the COVID-19 pandemic is needed as a future learning

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effort for similar outbreaks that might occur in East Kalimantan. The purpose of the present study was to descriptively convey information about COVID-19 cases in East Kalimantan during the period from March 18, 2020, to April 18, 2020.

Materials and Methods

Data collection

Timeline information on the COVID-19 cases in East Kalimantan was tracked from broadcasts and announcements from the East Kalimantan Provincial Health Office [13], Samarinda City Health Office [14], and Balikpapan City Health Office [15] news channels based on official announcements and reportage, interviews, and communication with field workers at health offices in East Kalimantan, Hospitals, and Emergency Reporting Task Force 112.

Data processing

Official data collected from the Provincial Health Office, Samarinda City Health Office, and Balikpapan City Health Office were collated in a database and analyzed using Microsoft Office Excel software.

Statistical analysis

Statistical analysis was performed by Microsoft Office Excel 365 (Microsoft, Redmond, Washington, USA).

Ethics statement

The laboratory and diagnostic procedures of this study were approved by the Health Research Ethics Committee of the Faculty of Medicine, Mulawarman University, Samarinda, East Kalimantan, Indonesia (Jl. Kerayan Kampus Gunung Kelua, Samarinda, East Kalimantan, Indonesia).

Results and Discussion

Progress of COVID-19 cases

COVID-19 cases were first reported in Jakarta, Indonesia since March 02, 2020, and following that, the first case in East Kalimantan province was detected on March 18, 2020. The timeline of COVID-19 progression in East Kalimantan Province can be seen in Table 1.

Tracing and Isolation before the use of rapid tests

The WHO has established procedures for handling infectious diseases with four main steps: Isolate, test, treat, and trace [16]. The implementation of this handling procedure has varied by country. For example, South Korea initiated a large scale use of rapid tests [17], China implemented strict lockdown procedures in affected provinces [18], India has used force to curb dissidents in lockdown [19], and Indonesia has established large-scale social restrictions [20].

In Indonesia, there have been differences between regions in the way that people under observation (PUO) and patients under investigation (PUI) have been determined [21]. East Kalimantan, for example, with a population of about 3.7 million, has more PUO than other more populated provinces [22]. The determination of PUO, in general, is based on a history of trips to an area with the local transmission or overseas travel [23]. In East Kalimantan, the community's compliance in reporting themselves to the hotline number 112 or 119 in Samarinda and Balikpapan was good, and the performance of the hotline team was also satisfactory. The mean daily tracing performance from March 20, 2020, to April 18, 2020, was one positive confirmed for every 14.3 PUO and one positive confirmed for every 6.9 PUIs. In addition, 48% of the PUIs were confirmed negative.

The Samarinda and Balikpapan fast response teams quickly disseminated information on the initially identified clusters such as the Seminar *Sinode* Bogor, Seminar *Anti Riba* Bogor, General Election Commission meetings, and other trips or meetings in areas with local transmission. This information was widely disseminated through social media channels in one or several posts which were easy to read and understand [24]. The return of participants from *Ijtima Gowa* was considered as a very challenging tracing activity, due to the sheer number of people and their locations.

The performance of the tracing can be calculated based on daily published data by the East Kalimantan Health Office. For example, on March 19, 2020, the first publicly available data, there were 208 PUOs, 39 PUIs, three positives and 11 negatives [13]. This means COVID-19 positive individuals as a percentage of total PUO and PUI at that time were 1.4% and 7.7%, respectively. The highest percentage of COVID-19 positive of PUO and PUI occurred on March 28, 2020, with 21.0% and 0.7%, respectively. On a monthly mean, the percentage of COVID-19 positive of PUO and PUI was 14.4% and 0.7%, respectively.

Before the COVID-19 rapid test kit was received by the East Kalimantan Health Office, the procedure for determining PUI status was based on the Pedoman Pencegahan dan Pengendalian COVID-19 which had been revised 3 times by the Ministry of Health of the Republic of Indonesia [11]. PUI was determined

Table 1: COVID-19 timeline in East Kalimantan, Indonesia

Date	Event
March 18, 2020	Announcement of the first confirmed COVID-19 patient in East Kalimantan from a cluster of religious activities in Bogor. A total of 35 patients under investigation were identified in East Kalimantan from 31 January to March 18, 2020. Ten of them had been declared negative, one positive, and 24 other patients under investigations were still waiting for laboratory results
March 19, 2020	Thermal scanners started operating at Prato Airport Samarinda and SAMS Sepinggan Airport Balikpapan
March 20, 2020	Announcement of second and third confirmed COVID-19 patients in East Kalimantan from a cluster of sharia business activities in Bogor
March 23, 2020	The addition of six new positive cases in Balikpapan and Kutai Kartanegara (total cases: 9)
March 26, 2020	The addition of two new positive cases in Bontang and East Kutai (total cases: 11) KM Lambelu, a passenger vessel carrying around 1500 participants from Jema Gowa religious activities from East Kalimantan and South Kalimantan, docked in Balikpapan. Around 600 people immediately registered and were declared people under observation COVID-19 positive patients from the Jakarta travel cluster and the General Election Commission meeting were confirmed The first batch of shipments of medical personal protective equipment arrived in East Kalimantan.
March 27, 2020	The Indonesian Ulama Council in East Kalimantan issued a circular for Friday and as a result, congregational prayers were not carried out, instead replaced with prayers at home during the COVID-19 pandemic
March 28, 2020	The addition of six new positive cases in Balikpapan (total cases: 17)
March 29, 2020	Official announcement of the first death case. A participant of the religious event Jema Gowa died as patients under investigation. The person arrived in Balikpapan on a transit flight trip to Banjarmasin from Makassar on March 22, 2020, and tested positive for COVID-19 in the following days A trial was started on the use of rapid tests in East Kalimantan, and from this point, the determination of patients under investigation has been with rapid tests
March 30, 2020	A patient under investigation from a new cluster (Makassar city cluster) was identified by rapid test in Samarinda; the patient under investigation was then isolated and tested positive for COVID-19 about a week afterward Balikpapan was declared as a local transmission area of COVID-19 by the Ministry of Health An agreement to check access between cities was put in place by two cities in East Kalimantan (Balikpapan and Samarinda). They implemented restriction to main road sections
March 31, 2020	The addition of three new positive cases in Balikpapan (total cases: 20)
April 01, 2020	The addition of one new positive case in Kutai Kartanegara (total cases: 21)
April 02, 2020	The addition of one new positive case in Samarinda (total cases: 22)
April 04, 2020	The addition of two new positive cases in Samarinda and East Kutai (total cases: 24) Two first cases of recovery in Bontang and Kutai Kartanegara
April 05, 2020	The addition of one new positive case in Samarinda (total cases: 25) KM Queen Soya, a passenger ship from Pare-pare, docked at Samarinda Harbor. Thermal scanning and brief interviews related to travel history were carried out and 200 people under observations were determined. Based on tracing data, KM Queen Soya brought 541 passengers from Pare-Pare on March 28, 2020, and 284 people on April 04, 2020. Another passenger vessel, KM Aditya, sailed with 297 people on March 29, 2020, and 104 people on April 05, 2020. The total number of ship passengers who had arrived in Samarinda since March 28, 2020, was 1,226.
April 06, 2020	The addition of six new positive cases in Penajam Paser Utara and Balikpapan (total cases: 31)
April 07, 2020	One patient recovered in East Kutai, to a total of three recovered cases
April 08, 2020	The addition of one new positive case in East Kutai (total cases: 32) Three patients recovered in Balikpapan, to a total of six recovered cases
April 09, 2020	Airlines decided to reduce 95% air traffic from and to East Kalimantan
April 10, 2020	The use of the C19 rapid test coupled with NS1 rapid test as a false positive cross-check against dengue hemorrhagic fever started The addition of three new positive cases in Samarinda, Balikpapan, and Berau (total cases: 35)
April 12, 2020	The prohibition of mudik (the tradition of going home during religious holidays) was issued by the Government of East Kalimantan
April 13, 2020	A total of 1264 rapid tests had been carried out, with 43 patients under investigations reactive to rapid tests
April 15, 2020	A total of 1637 rapid tests had been carried out, with 65 patients under investigations reactive to rapid tests
April 16, 2020	The addition of nine new positive cases in Berau, West Kutai, and Balikpapan (total cases: 44) At least five burials using the COVID-19 protocol in East Kalimantan, although three of them had been confirmed negative
April 17, 2020	Another cluster was established, namely, a trip to Sangatta, East Kutai Of 151 crew of KM Lambelu, 92 were confirmed positive for COVID-19 The increase of patients under investigation since the rapid test started was 4.09 persons per day
April 18, 2020	The addition of ten new positive cases in Penajam Paser Utara, Paser, and Balikpapan (total cases: 54). Of all the regencies in East Kalimantan, only Mahakam Ulu has not been affected by this stage Eleven patients recovered (case fatality rate total cases 1.85%; case fatality rate closed cases 8.3%, recovered closed cases 91.7%) Tracing performance from March 20, 2020, to April 18, 2020, was an average of one positive confirmed for every 14.3 people under observations and one positive confirmed for every 6.9 patients under investigations, with 48% of the patients under investigations confirmed negative

COVID-19: Coronavirus disease-19.

based on contact with positive confirmed COVID-19 or travel to areas that had been designated as local transmission and/or the patient had shown symptoms consistent with COVID-19. The main symptoms are fever ($\geq 38^{\circ}\text{C}$) accompanied by dry cough, shortness of breath, body weakness, or diarrhea. As of March 30, 2020, 169 PUIs had been established, 84 of which were declared negative and 17 confirmed positive, with 68 PUIs waiting for confirmation of test results.

Confirmed COVID-19 patients were isolated in a hospital in the nearest city. Patients with a history of contact or travel to areas with local transmission of COVID-19 and show symptoms resembling COVID-19 were isolated. A part from these categories, all PUO and PUI were urged to carry out independent isolation for at least 14 days in their homes [23].

Use of rapid test in determination of PUI

The use of finger prick antibody-based rapid tests for the determination of the status of a person suspected of having COVID-19 has been carried out

in several countries [25]. Several rapid tests have been recommended by health authorities [26]. The accuracy rate of rapid test detection is expected at 70–90%, depending on the sensitivity of the kit produced by each manufacturer. These tests use a blood sample to detect antibodies (IgG and/or IgM) as the host response to COVID-19 infection [27].

On March 26, 2020, the Government of the Republic of Indonesia, through its Pedoman Pencegahan dan Pengendalian COVID-19 4th revision, established the procedures for establishing the PUI by rapid test [11]. This device was distributed throughout Indonesia, and East Kalimantan was allocated with 2 400 units of rapid tests. This device arrived on March 27, 2020 and was subsequently distributed to all District Health Offices in East Kalimantan. The use of rapid tests in Samarinda City was first recorded on March 29, 2020. The first result of rapid tests was announced on March 30, 2020. After being screened with rapid test, 175 PUIs had been subjected to the more accurate swab tests, of which 35 PUI swabs were waiting for the swab results (Figure 1). There were 120 confirmed negative PUIs and 20 PUIs confirmed positive for COVID-19.

The use of rapid tests since March 30, 2020, helped the tracing team to identify PUIs. For example, on March 30, 2020, of 169 PUIs, 84 were negative for COVID-19 and 17 of them were positive using swab test, and positive cases as a percentage of confirmed negatives were 20.2%. On April 18, 2020, from 352 PUIs were registered, 170 were negative, and 54 were positive cases. Hence, positive cases as a percentage of confirmed negatives were 31.8%. Therefore, it was concluded that the use of the rapid test had increased the screening capability of the tracing team.

The increase in PUIs with the establishment of rapid tests was 4.09 people per day since March 30, 2020 (Figure 1). On April 16, 2020, a rate of 442 rapid tests and 95.13 swabs per 1 million populations was reported. The number of rapid tests performed on a national scale was not available. However, the rate of swab tests for East Kalimantan was considered slightly lower than the national rate of 156.36 swabs per 1 million populations. As of April 18, 2020, there was a cumulative total of 352 PUIs, with 128 people waiting for the results of the swab test. About 170 people were negative and 54 people were positive for COVID-19 [13].

As an important note, the use of rapid tests in Indonesia may be accompanied by other rapid tests. Since Indonesia is a country with endemic Dengue hemorrhagic fever (DHF), some positive blood-based rapid test PUIs were cross-checked with the NS1 rapid test designed for DHF. The use of cross-checking with NS1 kits has never been reported in publications in subtropical countries because DHF is endemic to tropical countries [28].

1 Distribution of COVID-19 to regencies in East Kalimantan

The dynamics of the **6** spread of COVID-19 are still being elucidated, but a Basic Reproduction Number (R_0) of 2.2–5.7 has been reported in the literature [1]. Awareness of the rapid spread of COVID-19 needs to be improved. Trips between regions or cities with public transport are considered to be the main contagion vector. The focus of attention is preventing an outbreak of cases in areas with limited health facilities such as the communities in distant and remote areas that are abundant in East Kalimantan [29].

The COVID-19 patients were first confirmed in Samarinda city on March 18, 2020 (Figure 2). Within a week, the spread of confirmed COVID-19 patients expanded to five other regencies. Penajam Paser Utara and Berau recorded positive COVID-19 patients, comprising 11% and 3%, respectively, of the total confirmed cases in East Kalimantan on April 10, 2020. The confirmed number of COVID-19 cases increased to 54, of which 11 were declared cured as reported on April 18, 2020. The spread of COVID-19 has also reached areas distant from

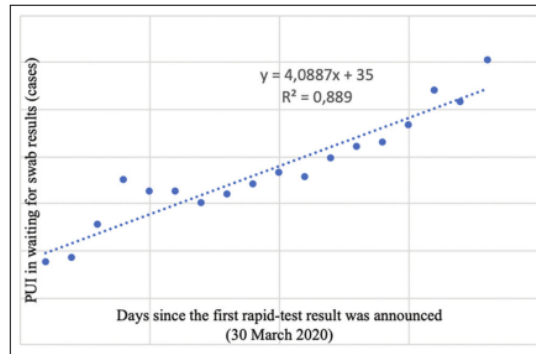


Figure 1: Development of patients under investigation with positive rapid tests since March 30, 2020

airports and main harbors such as the West Kutai and Paser Regency. The highest increase in COVID-19 confirmed that patients were in Penajam Paser Utara Regency [13].

Determination of the distribution cluster

Tracing of the main clusters of COVID-19 distribution was based on a travel history interview or contact by the PUI. COVID-19 patients would confirm their travel history or contact data and were then be submitted to the surveillance teams. After the data were confirmed, the surveillance teams conducted contact tracing based on the information obtained [23]. The main confirmed clusters were subsequently announced in a daily broadcast by the Provincial Health Office. Announcement of the main clusters of the spread of COVID-19 increases community awareness through self-reporting and community reporting through community leaders, heads of villages, and neighborhood units. This is especially important for people without symptoms who have contact with PUI or have a history of travel to areas with local transmission.

Conclusion

During the month since the first case of East Kalimantan was announced on March 18, 2020, an initial spread of COVID-19 was identified in five regencies and has subsequently reached nine regencies in East Kalimantan. The tracing performance of the 112 teams in East Kalimantan can be considered satisfactory during the 1-month observation period, with a mean of 0.7% of PUO and 14.4% of PUI confirmed as COVID-19 positive. The use of rapid tests since March 30, 2020, has increased the detection ability of the tracing team from 20.2% to 31.8%, expressed as confirmed positive PUI as a percentage of confirmed negative PUI. The

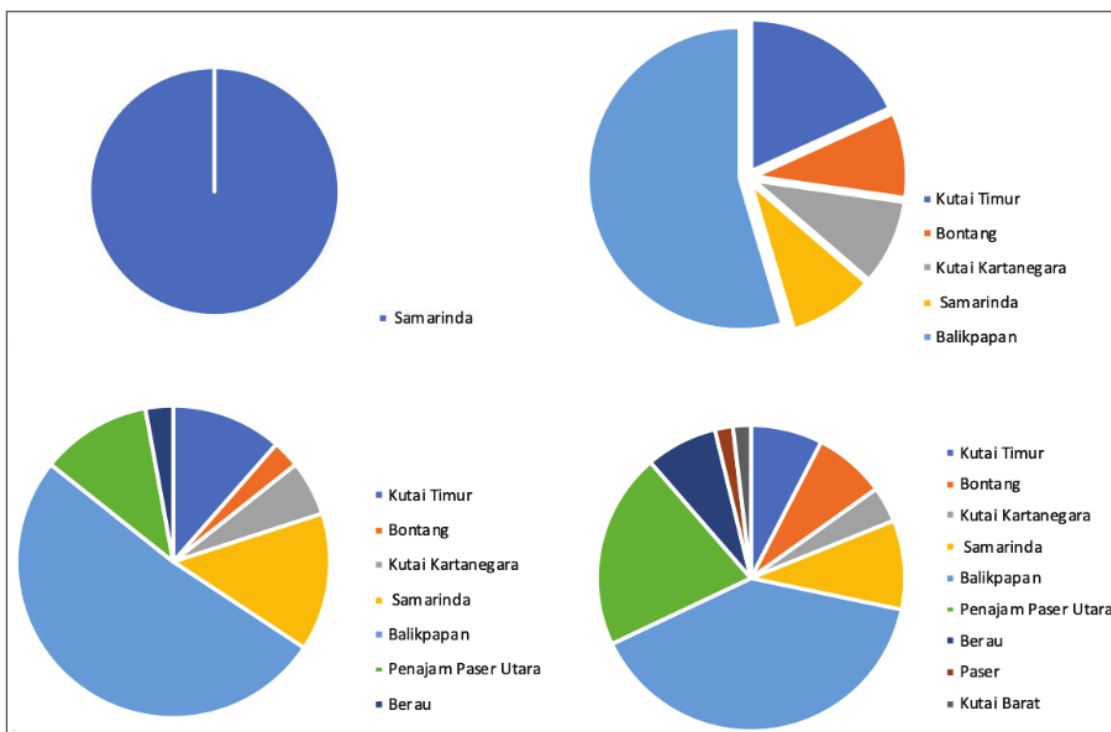


Figure 2: Snapshot of coronavirus disease-19 East Kalimantan cases

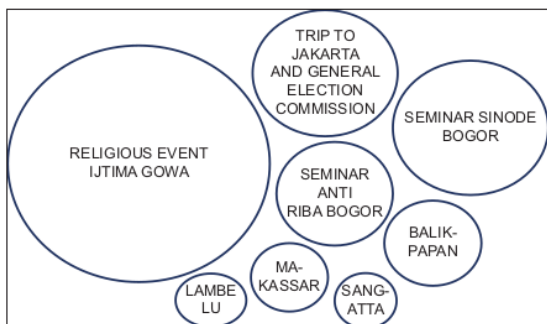


Figure 3: Origin of the East Kalimantan coronavirus disease-19 cluster

use of the COVID-19 rapid test can be cross-checked with a DHF rapid test. Precautions for the spread of COVID-19 should be increased in districts with larger areas and more limited health facilities than in urban areas. Confirmed clusters need to be announced to the public to increase the effectiveness of community self-reporting. In 1 month since the first confirmed patient, 54 cases were confirmed, 11 patients recovered, and one confirmed COVID-19 patient died. The total case fatality rate (CFR) was 1.85%, closed case CFR was 8.3%, while the closed case recovery rate was 91.7%. Tracing of the main clusters of COVID-19 distribution was based on a travel history interview or contact by the PUI (Figure 3). COVID-19 patients would confirm their travel history or contact.

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