ORIGINAL ARTICLE

COVID-19 MORTALITY CASES IN KUBANG PASU DISTRICT

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ABSTRACT

COVID-19 has rapidly impacted on mortality worldwide. Early identification of COVID-19 cases in community at high risk of death can enhance patient treatment and resource allocation. The goal of this study is to identify the characteristics of COVID-19 mortality cases in Kubang Pasu districts in 2021. Data on mortality cases in the year 2021 in Kubang Pasu district were collected, extracted and analyzed. There are 210 (1.9%) mortality cases had been recorded in 2021 due to COVID-19 infection form 11019 COVID-19 cases in Kubang Pasu district. The mortality cases consist of 108(51%) female and 102(49%) male. The highest mortality cases involved the age group of more than 70 years old with 73 (34.8%) cases. The highest race was Malay 193(91.9%), followed by non-Malaysian(2.9%), Chinese 4(1.9%), Siamese 4(1.9%) and Indian 3(1.4%) respectively. Most of the mortality cases are unvaccinated 153 (72.9%). The most coomon cause of death is due to COVID-19 pneumonia with 205 (97.5%) cases. Majority of the cases were screen through symptomatic screening and close contact screening 86 (40.9%) cases and 52 (24.8%) respectively. Among the mortality cases, there are 22(10.5%) brought-in-death cases which 19 (86%) cases are Malay. Most of the brought-in-death cases are unvaccinated, 19 (86%) cases, incomplete vaccine 1 (5%) case and 2 (9%) cases completed vaccine. The highest number of mortality cases occur among those with age more than 70. It involved mostly among Malay race and they were unvaccinated. Lung complication is the main cause of death since most of the mortality cases passed away due to pneumonia. This high number of mortality and BID cases might be attributed to poor health-seeking behaviour among the Kubang Pasu population with COVID-19. Promotion activities about COVID-19 and vaccine should be strengthened further to improve the knowledge and actions towards COVID-19 in community.

Keywords: *COVID-19 mortality, brought-in-dead, COVID-19 pneumonia, COVID-19 vaccine, health-seeking behavior.*

INTRODUCTION

The continuing coronavirus disease pandemic (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has resulted in an alarming number of deaths worldwide[1]. Scenarios of COVID-19 mortality have been critical inputs for pandemic response efforts, and decision-makers needed information about pandemic control activities performance[2]. Until December 2021, there are 290 million cumulative cases recorded around the world with almost 2.8 million cumulative cases in Malaysia[3]. Much is unclear about the disease dynamics and risk factors as the pandemic spreads over the world. A greater knowledge of the clinical drivers of illness severity can help to enhance patient care across the healthcare system. This work is difficult due to the disease's fast spread and a lack of precise patient data. The number of mortalities in each nation, as well as the trajectory of each country's mortality rate, are indicators of great public interest that are regularly debated by public health specialists. There is a need to stratify the cases by sociodemographic background and there is underrepresentation of some information of the cases. Global COVID-19 data on the number of cases and deaths among children and adolescents are limited, which makes it challenging to understand the many ways in which children, young people and older people are being affected by the pandemic[4]. Despite these drawbacks, our findings corroborate the evidence in quantifying the death toll of COVID-19 that can represent the background of the community.The Kubang Pasu District is a district in northern Kedah, Malaysia. It contains the border town of Bukit Kayu Hitam as well as the educational hub of Changlun, while Jitra is the largest town and administrative centre of the district. The district council had been upgraded into municipal council on 22 October 2018, become the fifth city or municipal in the state.

The district is also known as Education Valley in Kedah because there is a concentration of educational institutions in Kubang Pasu. They are Universiti Utara Malaysia, Kolej Matrikulasi Kedah (KMK), Polytechnic of Sultan Abdul Halim Mu'adzam Shah, Industrial Training Institute (ILP), Bandar Darulaman Community College (Kolej Komuniti Bandar Darulaman), Akademi Binaan Malaysia (ABM), Institut Kemahiran Belia Negara (IKBN) and others.

Figure 1: Location of Kubang Pasu District in Kedah

In 2021, there were 11019 cases of COVID-19 recorded in Kubang Pasu district with 210 mortality cases. Data of the mortality cases had been collected through the surveillance system at the district level and had been analyzed to describe the characteristics of the cases descriptively. It is important to know the characteristics of the mortality cases in Kubang Pasu so that we can plan proper intervention plan to reduce the number of the mortality cases.

METHODS

The sample of this study is N = 210 of mortality cases in Kubang Pasu district. Period under study was from January to December 2021, using secondary data of confirmed mortality cases due to COVID-19. The listing of mortality cases due to COVID-19 in Kubang Pasu District in 2021 had been analysed using Microsoft Excel. Variable used are gender, race which consist of Malay, Chinese, Indian, Siamese and Non-Malaysian, age group, sub-district, vaccine status, COVID-19 Assessment Center (CAC) attendance, types of screening, mortality category (BID or in-patient) and cause of death.

The diagnosis of COVID-19 cases were confirmed by RT-PCR and RTK test done to the patient/deceased as per guideline by the Ministry of Health Malaysia[5,6].

Completed doses of vaccines refer to the 14 days after the recomended doses of vaccine (CoronaVac-Sinovac, Comirnaty-Pfizer BioNTech® and Oxford-AstraZeneca)[7].

Data were extracted and analyzed with descriptive statistics of variables given by arithmetic mean and standard error of the mean. The incomplete data were deal by calling back the patient family members and counter checking from vaccine record and COVID-19 investigation form. However, there is a possibility of recall bias since the interview is done to the family members of the deceased.

RESULTS

A total of 210 COVID-19 deaths were reported during 2021, from January to December 2021. The trend of COVID-19 death cases showed an increase in parallel with the number of new case detections as shown in Figure 2.

As reflected in Figure 1, the highest mortality cases was in August 2021 with 75 (35.7%) cases from the total 210 mortality cases. No mortality cases recorded in February and March.

Sociodemographic characteristics

From the data collected from 210 (1.9%) mortality recorded in 2021 due to COVID-19 infection form 11019 COVID-19 cases in Kubang Pasu district, the mortality cases consist of 108(51%) female and 102(49%) male. The highest race was Malay 193(91.9%), followed by non-Malaysian 6(2.9%), Chinese 4(1.9%), Siamese 4(1.9%) and Indian 3(1.4%) respectively.

The number of mortality due to COVID-19 cases was found to increase with age. In general, the mean age for COVID-19 deaths in the year 2021 was 62.2 (± 15.13) years. Those in the age group of 70-79 years old were found to have the highest mortality cases of 56 (26.7%) cases, followed by aged 60-69 years with 54 (25.7%) cases and 42 (20.0%) cases for those aged 50-59 years old.

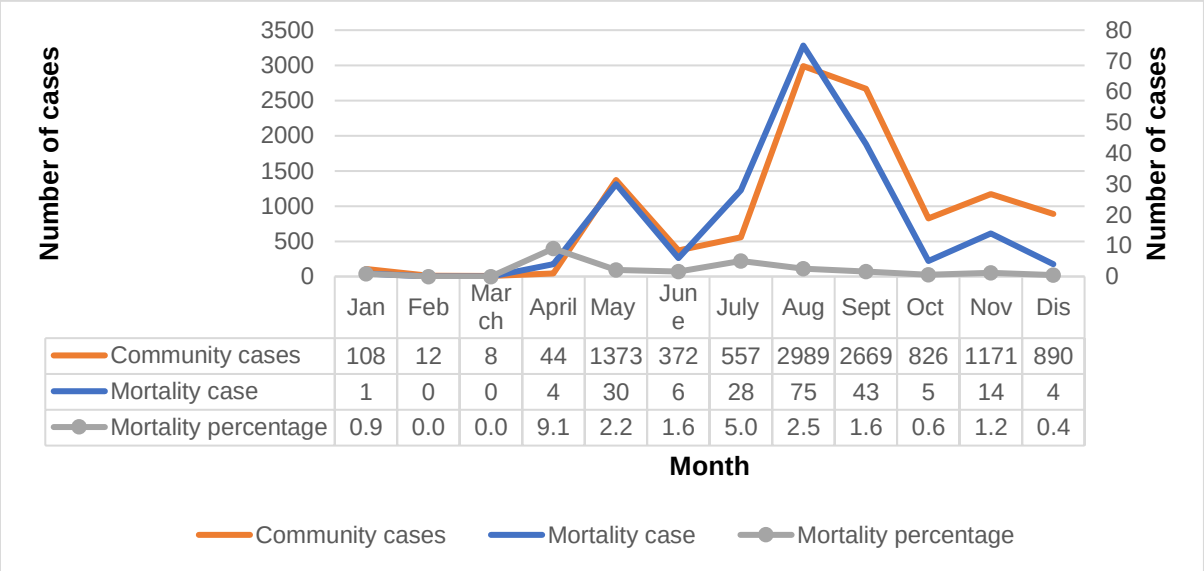

Figure 2: Monthly mortality versus COVID-19 cases in community.

Table 1: Sociodemographic of mortality cases

Variables	N (%)	Mean (SD)
Gender		
Male	102 (49)	
Female	108 (51)	
Race		
Malay	193 (91.9)	
Chinese	4 (1.9)	
Indian	3 (1.4)	
Siamese	4 (1.9)	
Non-Malaysian	6 (2.9)	
Group age		
0-4	1 (0.5)	62.2(±15.1)
5-11	Nil	
12-17	Nil	
18-29	5 (2.3)	
30-39	14 (6.7)	
40-49	18 (8.6)	
50-59	42 (20.0)	
60-69	54 (25.7)	
70-79	56 (26.7)	
≥80	20 (9.5)	

The highest number of mortality cases was recorded in the sub-district of Jerlun and Naga with 33 cases each. It covers 31.4% (66 cases) from the total mortality cases in Kubang Pasu district.
Vaccination status.

From 210 mortality cases, there are 153 (72.9%) cases are unvaccinated, most of the unvaccinated cases came from the age group of 70-79 counted at 41 (26.8%) cases. Majority of them are Malay race 138 (90.2%) cases followed by non-Malaysian, Chinese, Indian and Siamese, 5 (3.3%) cases, 4 (2.5%), 3 (2.0%) and 3 (2.0%) respectively. In term of gender, shared almost the same number with 77 (50.3%) cases are male and 76 (49.7%) cases female.

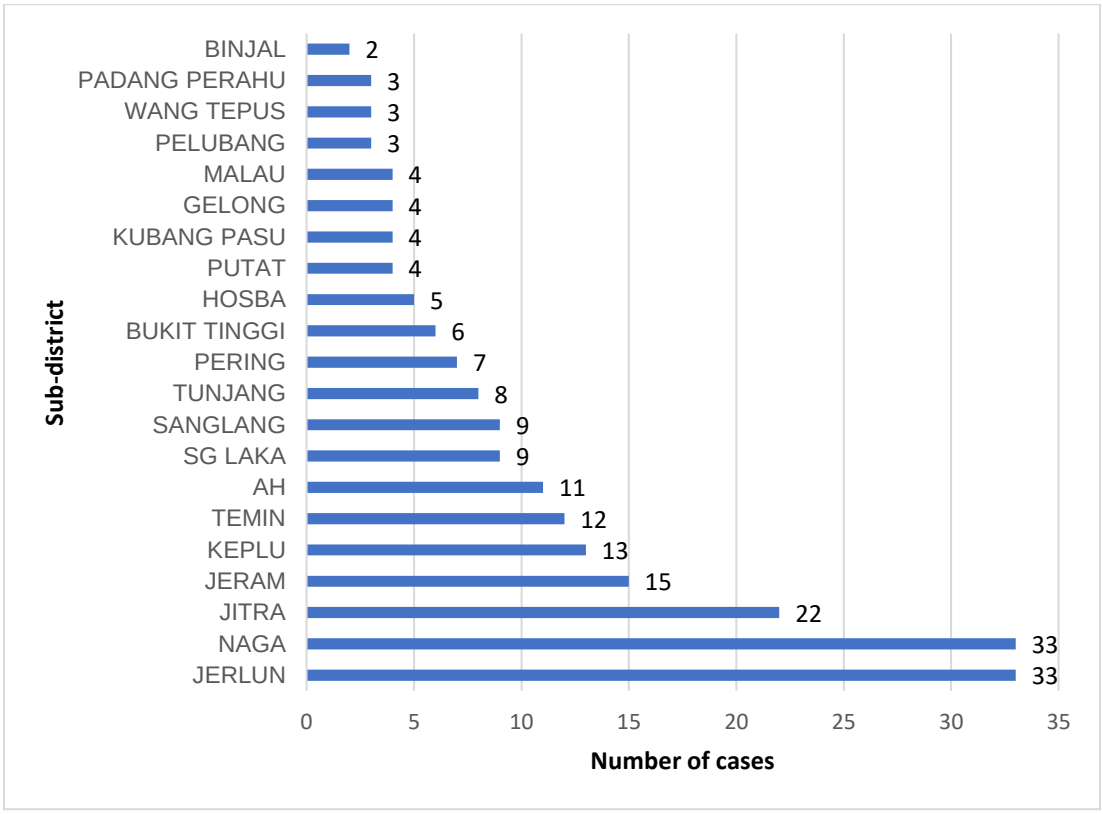

Figure 3: Mortality cases according to sub-district.

Table 2: Vaccine status of the mortality cases

Variables	N (%)	Mean(SD)
Vacccine status		
Unvaccinated	153 (72.9)	
Incomplete	23 (11.0)	
Complete	34 (16.2)	
Age group of unvaccinated case		
0-4	1 (0.7)	62.2(±15.1)
5-11	Nil	
12-17	Nil	
18-29	5 (3.3)	
30-39	11 (7.2)	
40-49	16 (10.5)	
50-59	28 (18.3)	
60-69	36 (23.5)	
70-79	41 (26.8)	
≥80	15 (9.7)	
Race		
Malay	138 (90.2)	
Non-Malaysian	5 (3.3)	
Chinese	4 (2.5)	
Indian	3 (2.0)	
Siamese	3 (2.0)	
Gender		
Male	77 (50.3)	
Female	76 (49.7)	

Table 3: Types of screening for COVID-19 diagnosis among mortality cases

Type of screening	N (%)
Cluster screening	30 (14.3)
Symptomatic screening	86 (40.9)
Hospital screening	30 (14.3)
Mortality screening	7 (3.3)
Self screening	4 (1.9)
Close contact screening	52 (24.8)
Severe Acute Respiratory Illness (SARI) screening	1 (0.5)

The types of screening for COVID-19 diagnosis among mortality cases were shown in Table 3. Most of the mortality cases were diagnosed as COVID-19 through symptomatic screening 86 (40.9%) cases followed by close contact screening 52 (24.8%) cases, cluster and hospital screening with 30 (14.3%) cases each, mortality screening 7 (3.3%) cases, self screening 4 (1.9%) and 1 (0.5%) case through SARI screening.

Table 4: Number of COVID-19 Assessment Centre (CAC) attendees among the mortality cases and the category of initial assessment.

COVID-19 Assessment Centre Attendees	N (%)
Absent	169 (80.5)
Present	41 (19.5)
Category during assessment	
Category 1a	4 (9.8)
Category 2b	14 34.1)
Category 3c	2 (4.9)
Category 4d	20 (48.9)
Category 5e	1 (2.3)

Category 1: Asymptomatic, Category 2: Symptomatic, no pneumonia, Category 3: Symptomatic with pneumonia and need treatment and observation at hospital, Category 4: Symptomatic with pneumonia and need oxygen support,Category 5: Critically ill with multiorgan involvement. Sources: Ministry of Health, Malaysia.

Among the mortality cases, only 41 (19.5%) cases had came for assessment at CAC. Those who had been assessed mostly falls under category 4 with 20 (48.9%) cases.

Table 5: Cause of death

Cause of death	N (%)
COVID-19 pneumonia	205 (97.5)
Drowning in a man with COVID-19	1 (0.5)
Perforated duodenal ulcer in a man with coronary atherosclerosis and COVID-19	1 (0.5)
Septic shock secondary to urosepsis with COVID-19	1 (0.5)
Carbapenem-resistant Enterobacteriaceae bacteremia with COVID-19 and underlying Systemic Lupus Erythematosus	1 (0.5)
Sepsis secondary to meliodosis with COVID-19	1 (0.5)

From the data collected, most of the mortality cases are due to pneumonia with counted 205 (97.5%) cases.

Brought-in-dead (BID) cases

Kubang Pasu District had recorded 22 BID cases in the year 2021. The characteristics of the BID cases are shown in Table 6:

As a result of the analysis, several factors have been identified to contribute to the occurrence of brought-in-dead (BID) cases. Among the factors that have been identified are the patient's delay in seeking treatment when symptoms begin; with this factor was found in 15 cases (68.2%) out of 22 BID cases reported. Failure to identify close contacts when conducting case investigations has also been found to be among the factors

contributing to BID cases, with a total of 3 cases (13.6%) found to be related to those factors. Furthermore, sub-optimal close contact monitoring as well as delays in obtaining an ambulance following the high case load in PKDs and hospitals also contributed to the BID cases with each being linked in 2 cases (9.0%) of BIDs. In addition, weaknesses in ILI case management were identified to contribute to 1 case (4.5%) of BID

Table 6: Characteristics of BID cases

Variables	N (%)	Mean(SD)
Gender		
Male	11 (50.0%)	
Female	11 (50.0%)	
Age group		
30-39	2 (9.1)	62.2 (±15.1)
40-49	2 (9.1)	
50-59	5 (22.7)	
60-69	5 (22.7)	
70-79	4 (18.2)	
≥80	4 (18.2)	
Race		
Malay	19 (86.5)	
India	1 (4.5)	
Chinese	1 (4.5)	
Non-Malaysian	1 (4.5)	
Vaccine status		
Unvaccinated	19 (86.5)	
Incomplete	1 (4.5)	
Completed	2 (9.0)	

DISCUSSIONS

The ongoing epidemic of coronavirus disease 2019 (COVID-19) is devastating, despite extensive implementation of control measures. It gives a significant impacts to the health systems and community which includes health services and the number of cases and mortality. According to statistics from 26 countries, adults aged 70 and above account for 37 percent of COVID-19-related mortality in low and middle income countries, compared to 87 percent in high income countries[8].

Patient comorbidities such as hypertension, diabetes, and obesity have been shown to be associated with higher COVID-19 mortality[9]. Since the number of comorbid conditions steadily increases with age, this could be another possible explanation of the observed increased mortality in older patients. While disease mortality is higher in the elderly in other conditions like cardiovascular disease, changes associated with immunsenscence might explain the increased vulnerability to infection and the disproportionately high mortality due to COVID-19 in older patients[10]. Vaccine had been shown to reduce symptomatic disease, hospitalisations, severe/critical disease and death after the second dose[11].

COVID-19 proliferation has been aided by increasing human-to-human transmission and a failure to implement preventative measures[12]. In order to reduce the number of BID cases, remedial measures need to be taken at each phase related to disease management and control. Among them, public awareness on the importance of seeking early treatment should be applied to each individual. When a case investigation is conducted, a more detailed emphasis needs to be placed on identifying all close contacts to positive cases, including close family as well as social contacts.

The large number of cases at a time may contribute to the delay of the ambulance service to pick up patients for treatment. Therefore, cooperation with private ambulance services/non-governmental organizations (NGOs) is expected to overcome this problem. Health personnel should also be constantly aware of the latest protocols related to the management of patients present with symptoms of Influenza-like illness (ILI). Continuing medical education especially involving the staff working in the relevant units needs to be done periodically.
Healthcare seeking behaviour (HSB) is described

as "any activity or inaction made by persons who feel themselves to have a health condition or to be unwell in order to locate a suitable cure" (13). Inadequate HSB has been connected to poorer health outcomes, higher morbidity and mortality, and lower health statistics, whereas early healthcare seeking has been linked to better health outcomes (13). Geographical, social, cultural, and demographic factors can all influence healthcare seeking behaviour. Knowledge and information about the disease, perception of the sickness, financial capabilities, and societal norms may all influence the usage of healthcare services during the COVID-19 pandemic[13].

With the increase in the number of cases recently, contact tracing process becoming more difficult, we hypothesise that this increase could be attributed to poor healthcare-seeking behaviour among the Kubang Pasu district community, which could be due to a lack of knowledge about the disease, perception of the illness, stigma associated with the disease, readily available drug stores aiding self-medication, as well as misconceptions about the severity of the disease due to the disease's relative high prevalence. We urge that investigations on the population's views of COVID-19 be conducted to investigate the determinants of the reported poor health seeking behaviour. We further urge that community awareness and involvement programmes for COVID-19 prevention and management be ongoing and successful.

Strength and weakness

Knowing the characteristics of the mortality cases is the district is important for planning of the activities for health promotion and intervention to reduce the number. Through this study we can detect the shortfall that happen in our daily activities in intervention to reduce the number of mortality. There are few of incomplete investigation form and need to reconfirmed with the family members. This will introduced to recall bias in doing this study. There is also limitation in getting comorbid of the cases due to incomplete data in the surveillance. The comorbidity data is very important to complete the characteristics of the mortality cases.

CONCLUSION

The highest number of mortality cases occur among those with age more than 70. It involved mostly among Malay race and they were unvaccinated. Lung complication is the main cause of death since most of the mortality cases due to pneumonia. This high number of mortality and BID cases might be attributed to poor health-seeking behaviour among those who age more than 70 in Malay population in Kubang Pasu infected with COVID-19. We therefore recommend that studies on the health seeking behaviour of the Kubang Pasu population regarding COVID-19 be carried out to determine the drivers of the observed poor health seeking behaviour. Promotion activities about COVID-19 through community based approach to disseminate health information to the high risk group and elderly. Besides, it is important to speed up the immunization of COVID-19 coverage among the high risk group and elderly.

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Competing Interests

None declared.

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