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### RESEARCH ARTICLE

#### AN ANALYSIS OF THE SUCCESS IN SUPPRESSING COVID-19 CASES IN BRUNEI DARUSSALAM

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#### Abstract

The rise of the COVID-19 pandemic has spread to over 200 countries and territories. At this time of writing, COVID-19 cases around the world continue to either grow increasingly or is slowing down. Some countries are seeing an emergence of a second wave of COVID-19 after an initial significant improvement. This paper has produced a complete contact tracing record of all cases in Brunei. Despite the size of Brunei's population, Brunei saw a large number of initial COVID-19 cases across the country. Through the Brunei Government's efforts, it has seen significant success in managing the outbreak. This paper depicts how the first COVID-19 case and other inbound cases Brunei spread throughout the country and further details information on active cases, number of deaths, number of tests, critical cases, re-infected cases and the actions taken by the Brunei Government. At this time, Brunei has only 1 contained case left and is unlikely to see a reemergence of the COVID-19 virus.

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#### Introduction:-

The coronavirus disease 2019 (COVID-19) is a highly viral disease that has spread across the world and affected over 212 countries and territories. COVID-19 virus is a novel coronavirus that has not been previously identified. "CO" stands for corona, "VI" stands for virus, "D" stands for disease and "19" stands for the Year 2019 in which it was first identified (CDC, 2020). The COVID-19 disease first appeared in December 2019 in Wuhan, China and was closely linked to a Wuhan seafood market thought to have been visited by numerous people who were infected with COVID-19. On Jan 2020, a study came out that reported an early case who became ill on 1 December 2019 had no association with the market. Investigations are ongoing (John Hopkins, 2020). Less and common COVID-19 symptoms range from fever, dry cough, tiredness, aches and pains, headache and a rash on the skin, or discolouration of the fingers or toes. More serious symptoms include difficulty in breathing, chest pains and loss of speech and movement. Most people experience mild to moderate respiratory illness, while the elderly especially with underlying medical problems such as diabetes, chronic respiratory disease and cancer are more likely to be seriously affected. On 30 January 2020, the World Health Organisation (WHO) declared the COVID-19 outbreak to be a Public Health Emergency of International Concern and on 11 April 2020, the COVID-19 was officially declared a pandemic (WHO, 2020). The Brunei Ministry of Health issued a press release notifying the public of severe pneumonia cases in Wuhan, China as early as 6 January 2020 and has since been working with the World Health Organisation (WHO) and other neighbouring countries to monitor, assess and manage the COVID-19 in the region (MOH, 2020a & MOH 2020b)

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As of 28 May 2020, there are currently a total of 5.8 million people who have been positively infected with the virus from 212 countries and territories. The USA leads with the highest cases in the world at 1.8 million, while China stands at 14<sup>th</sup> highest in the world at 83 thousand. In contrast, Brunei Darussalam has 141 cases while neighbouring countries in South East Asia such as Singapore, Indonesia and Malaysia have reported 33 thousand, 24 thousand and 8 thousand cases respectively (Worldometer, 2020). Despite world-wide efforts to create a vaccine, there is no clinically proven vaccine against the disease to date.

### **Methodology:-**

This study was conducted with data from official press releases and media statements issued by the Brunei Ministry of Health in addition. The data was extracted from 100 media statements (MOH, 2020b) issued between 10 March 2020 and 28 May 2020 in addition to 14 press releases issued between 6 January 2020 and 1 April 2020 (MOH, 2020a).

The extracted data produced the following charts and graphs including:

1. List of Complete Infected Cases in Brunei (including Date of Infection, Official Case Number, Sex and Age)
2. Contact Tracing of COVID-19 Cases in Brunei
3. Total COVID-19 Cases in Brunei
4. Total COVID-19 Cases by Sex
5. Age Range of COVID-19 Cases in Brunei
6. Total COVID-19 Quarantine Cases in Brunei
7. Total COVID-19 Tests Conducted in Brunei
8. COVID-19 Reinfected and Death Cases in Brunei
9. Total, Active & Recovered COVID-19 Cases in Brunei
10. COVID-19 Critical Cases in Brunei

### **Results:-**

As of 28 May 2020, a complete list (Figure 1) of all infected 141 COVID-19 cases in Brunei has been produced between its first case on 9<sup>th</sup> May 2020 and its latest case on 7 May 2020. The list includes detailed information specifically of the dates in which each of the 141 cases were tested positive for COVID-19. The list also includes the case number, sex and age of every COVID-19 case in Brunei Darussalam.

Date	Case No.	Male	Female	Age	Date	Case No.	Male	Female	Age	Date	Case No.	Male	Female	Age
9-Mar-20	1	1		53	15-Mar-20	49	1		24	24-Mar-20	97		1	60
10-Mar-20	2	1		61	15-Mar-20	50		1	55	24-Mar-20	98		1	30
10-Mar-20	3	1		30	16-Mar-20	51		1	29	24-Mar-20	99	1		66
10-Mar-20	4		1	46	16-Mar-20	52		1	27	24-Mar-20	100	1		66
10-Mar-20	5	1		12	16-Mar-20	53	1		42	24-Mar-20	101		1	45
11-Mar-20	6	1		5	16-Mar-20	54		1	39	24-Mar-20	102		1	60
11-Mar-20	7	1		34	17-Mar-20	55	1		21	24-Mar-20	103	1		41
11-Mar-20	8	1		32	17-Mar-20	56	1		17	24-Mar-20	104		1	51
11-Mar-20	9	1		59	18-Mar-20	57	1		53	25-Mar-20	105	1		17
11-Mar-20	10		1	33	18-Mar-20	58		1	42	25-Mar-20	106		1	23
11-Mar-20	11		1	52	18-Mar-20	59		1	13	25-Mar-20	107	1		51
12-Mar-20	12	1		53	18-Mar-20	60		1	13	25-Mar-20	108	1		72
12-Mar-20	13	1		45	18-Mar-20	61	1		12	25-Mar-20	109	1		33
12-Mar-20	14		1	44	18-Mar-20	62	1		3	26-Mar-20	110		1	21
12-Mar-20	15	1		33	18-Mar-20	63	1		62	26-Mar-20	111	1		42
12-Mar-20	16	1		63	18-Mar-20	64		1	49	26-Mar-20	112		1	51
12-Mar-20	17	1		33	18-Mar-20	65		1	29	26-Mar-20	113		1	20
12-Mar-20	18		1	30	18-Mar-20	66	1		7	26-Mar-20	114		1	50
12-Mar-20	19	1		34	18-Mar-20	67	1		20	27-Mar-20	115	1		39
12-Mar-20	20	1		64	18-Mar-20	68	1		12	28-Mar-20	116		1	59
12-Mar-20	21	1		35	19-Mar-20	69	1		46	28-Mar-20	117	1		21
12-Mar-20	22	1		31	19-Mar-20	70	1		72	28-Mar-20	118	1		20
12-Mar-20	23	1		63	19-Mar-20	71	1		52	28-Mar-20	119	1		35
12-Mar-20	24	1		30	19-Mar-20	72	1		46	28-Mar-20	120	1		32
12-Mar-20	25	1		64	19-Mar-20	73		1	68	29-Mar-20	121	1		21
13-Mar-20	26		1	46	20-Mar-20	74		1	16	29-Mar-20	122	1		67
13-Mar-20	27	1		21	20-Mar-20	75		1	10	29-Mar-20	123		1	19
13-Mar-20	28	1		25	20-Mar-20	76		1	37	29-Mar-20	124		1	30
13-Mar-20	29	1		16	20-Mar-20	77		1	15	29-Mar-20	125		1	51
13-Mar-20	30		1	13	20-Mar-20	78	1		54	29-Mar-20	126	1		31
13-Mar-20	31	1		64	21-Mar-20	79	1		28	30-Mar-20	127	1		3
13-Mar-20	32		1	25	21-Mar-20	80		1	0.5	31-Mar-00	128		1	36
13-Mar-20	33	1		39	21-Mar-20	81	1		43	31-Mar-00	129	1		25
13-Mar-20	34		1	2	21-Mar-20	82	1		27	1-Apr-20	130	1		39
13-Mar-20	35	1		60	21-Mar-20	83		1	45	1-Apr-20	131	1		28
13-Mar-20	36	1		56	22-Mar-20	84	1		32	2-Apr-20	132		1	40
13-Mar-20	37	1		28	22-Mar-20	85		1	10	2-Apr-20	133	1		38
14-Mar-20	38	1		17	22-Mar-20	86		1	54	3-Apr-20	134	1		22
14-Mar-20	39		1	38	22-Mar-20	87		1	55	4-Apr-20	135	1		43
14-Mar-20	40		1	0.75	22-Mar-20	88	1		39	10-Apr-20	136	1		28
15-Mar-20	41		1	31	23-Mar-20	89	1		51	18-Apr-20	137		1	31
15-Mar-20	42		1	55	23-Mar-20	90	1		40	19-Apr-20	138		1	50
15-Mar-20	43	1		29	23-Mar-20	91		1	36	6-May-20	139	1		40
15-Mar-20	44		1	23	24-Mar-20	92		1	39	7-May-20	140	1		46
15-Mar-20	45		1	56	24-Mar-20	93	1		57	7-May-20	141	1		31
15-Mar-20	46	1		56	24-Mar-20	94	1		56					
15-Mar-20	47	1		68	24-Mar-20	95		1	42					
15-Mar-20	48	1		20	24-Mar-20	96	1		50					

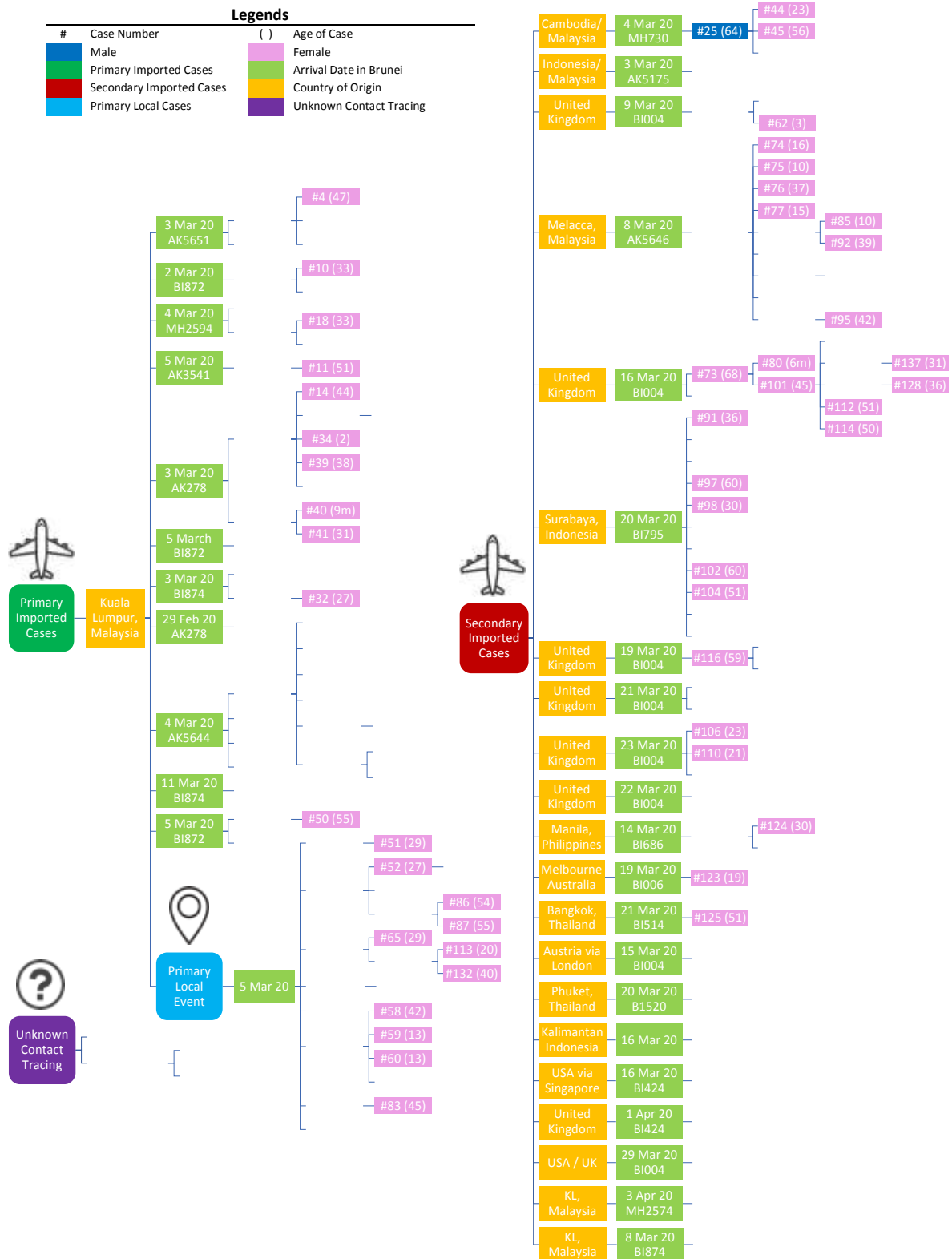
**Figure 1:** – List of Complete COVID-19 Cases in Brunei

Additionally, a chart (Figure 2) was produced that depicts the contact tracing of all COVID-19 cases in Brunei. It describes details including date of inbound flights, case number, age, sex and how cases were connected to each other.

Figure 2:-

**CONTACT TRACING CHART OF COVID-19 CASES IN BRUNEI DARUSSALAM**

Updated as of 17 June 2020



From the contact tracing chart (Figure 2), the first COVID-19 infection case was first reported on 9<sup>th</sup> March 2020. This case is the first discovery that came from a group that attended a religious congregation (tabligh) in Kuala Lumpur, Malaysia at the Jamek Sri Petaling Mosque. The congregation was attended by over 16,000 people from around the world.

It was found that 19 (23%) out of the 81 Bruneians who attended the congregation were infected with COVID-19. This incident is identified as the “Primary Overseas Case” that resulted in most of the subsequent cases in Brunei. Members who attended the tabligh in Kuala Lumpur also attend another local tabligh (Primary Local Event) as per Figure 2 in Brunei on 5<sup>th</sup> March 2020 and infected other people who attended. A total of 71 cases that spanned 4 generations were infected with COVID-19 from the attendance of the single event in Kuala Lumpur.

A total of 70 other cases in Brunei is represented as the “Secondary Overseas Cases” that also spanned up to 4 generations came from a combination of 21 separate incoming flights from other countries including the United Kingdom, Philippines, Malaysia, Thailand, Singapore and Indonesia. The origin of another 4 confirmed COVID-19 cases could not be traced as of yet.

Figure 3

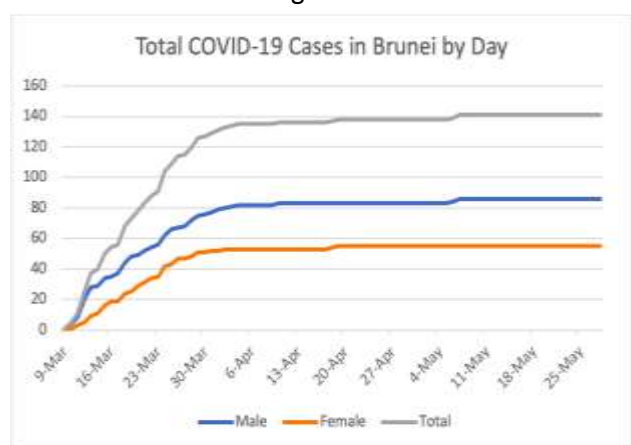
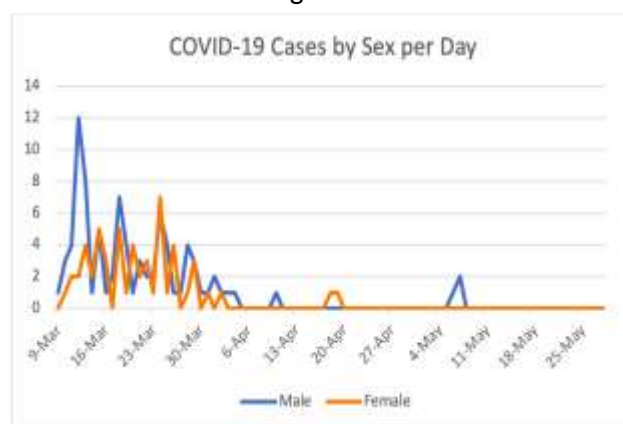


Figure 4



Since the first infection in Brunei on 9<sup>th</sup> March 2020, the number of cases peaked exactly 2 months later after 141 cases on 7<sup>th</sup> May 2020. There have been a total of 141 positive COVID-19 cases in Brunei Darussalam, of which there has been 86 male cases (61%) and 55 female cases (39%) (Figure 3). The highest number of single cases reported in a single day was 14 cases on 12<sup>th</sup> March 2020 followed by 13 cases on 24<sup>th</sup> March 2020.

The highest number of male infections was 12 cases on 12<sup>th</sup> March 2020 and the highest number of female cases was 7 cases on 24<sup>th</sup> March 2020 (Figure 4).

Figure 5

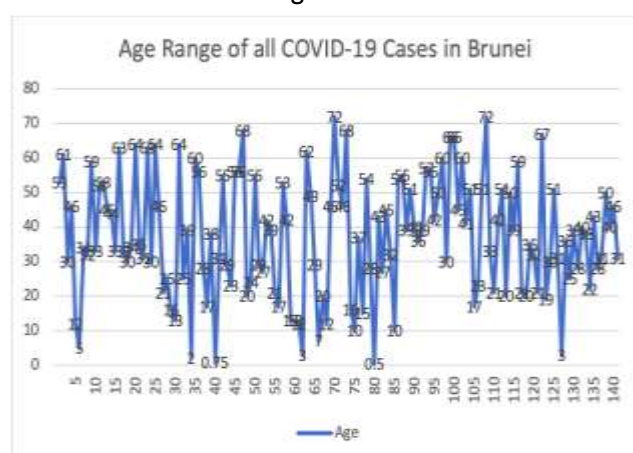
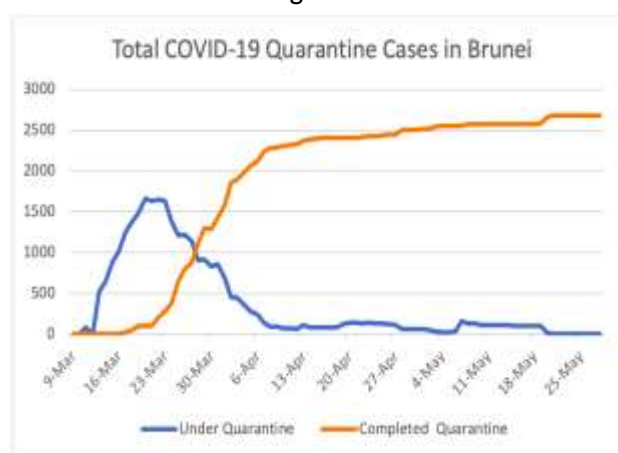


Figure 6



The oldest age for COVID-19 cases in Brunei is 72 years of age (Figure 5). The youngest case was a 6 month old baby. It was found that the median age of all COVID-19 cases was 37 years of age. The largest number of people who were placed under quarantine at any given time peaked at 1664 quarantines on 20 March 2020.

There are no longer any quarantine cases as of 21 May 2020. As of 28 May 2020, there has been a total of 2679 quarantine cases to date (Figure 6).

Figure 7

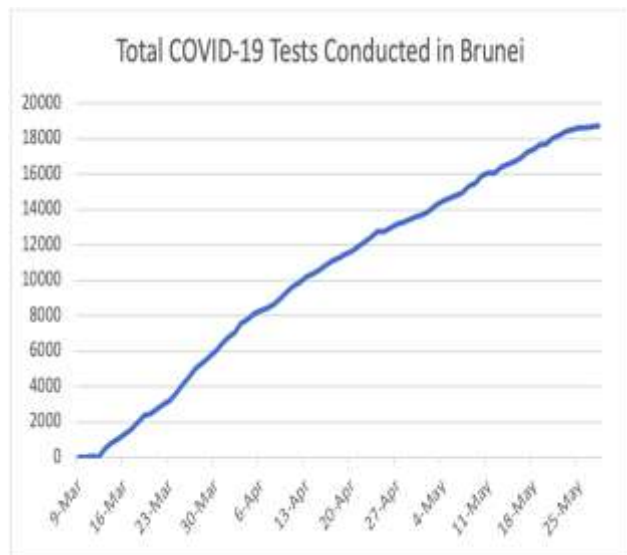
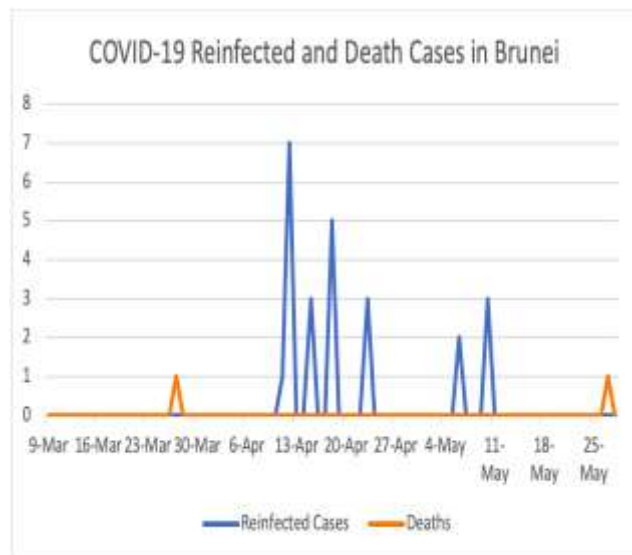


Figure 8



As of 28 May 2020, there has been a total of 18707 tests (Figure 7) conducted by the Ministry of Health over all suspected and reported cases throughout Brunei. Brunei saw the first case of COVID-19 reinfection, in which a positive COVID-19 case was released after quarantine and had to be readmitted after being retested as positive again on 11 April 2020. The highest number of readmitted infected cases was 7 cases on 12 April 2020. There has not been a readmitted case since 10 May 2020. To date, there have been a total of 24 cases (Figure 8) who have been readmitted.

Brunei saw the first COVID-19 related death on 27 March 2020 and the second death case on 27 May 2020 (Figure 8).

Figure 9

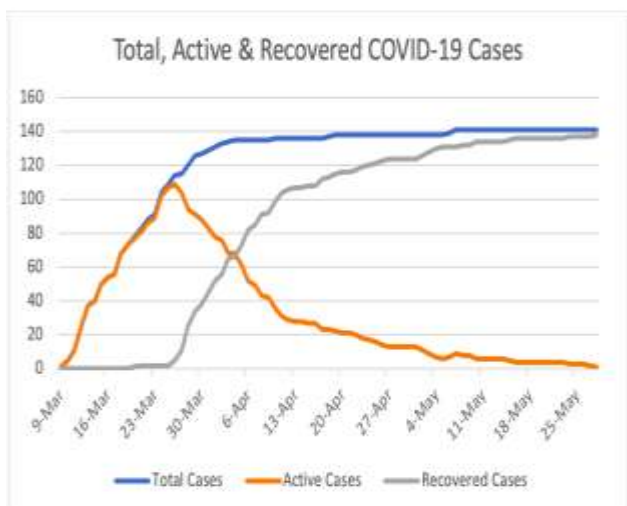
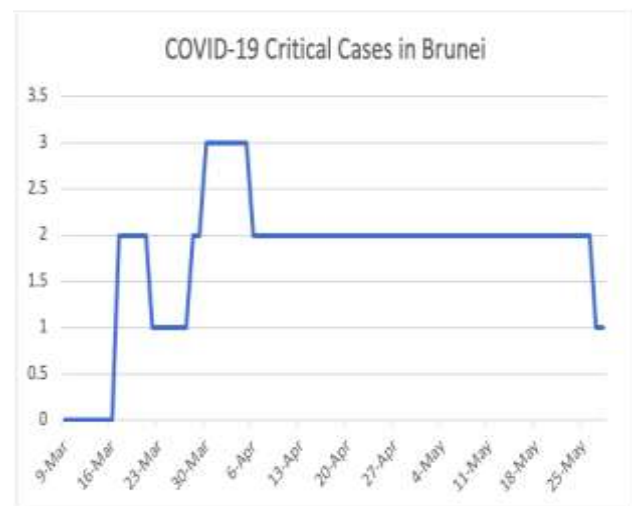


Figure 10



Of all the confirmed 141 cases, the number of active cases receiving treatment in quarantine peaked at 109 cases on 26 March 2020 (Figure 9). The last active case was released from quarantine on 28 May 2020. The first COVID-19 related critical case saw 2 people admitted to the Brunei National Isolation Centre on 17 March 2020. A critical case is defined as undergoing treatment at the Intensive Care Unit and requiring respiratory assistance. There were 3 critical cases that peaked on 30 March 2020 at the Brunei National Isolation Centre. As of 28 May 2020, there has been only one (Figure 10) remaining critical case in Brunei.

### **Discussion:-**

Since the first COVID-19 case in Brunei Darussalam on 9 March 2020, Brunei has seen a total of 141 cases to date on 7 May 2020. Since 18 April 2020, over a period of approximately 1.5 months, there has only been 3 additional cases. And since 7 May, for 3 weeks, there has been no new cases in Brunei. Within the first 3 weeks of the first Brunei COVID-19 case, there was a high infection surge totaling 126 cases by 29 March 2020 representing 89% of total national cases to date. Within 1 month at 8 April 2020, the number of cases increased only slightly to 135 cases or 96% of national cases.

Within a short period of less than 1 month, the spread of COVID-19 cases was seen to be limited and controlled across the country. The main reasons are mainly due to the Brunei Ministry of Health's efforts in prompt, transparent and clear health advisories to the public.

This includes early and transparent health information notification to the public as early as 6 January 2020 when the Chinese authorities made an official declaration of the severe pneumonia cases only a few days before on 3 January 2020. The ministry issued immediate health advisories to the public such as frequent handwashing, avoiding contact with other people who seemed unwell, the usage of face masks and hand sanitizers as well as seeking medical attention promptly if one is unwell.

Other significant efforts include restriction of air travel from other nationals into Brunei in addition to further restriction of Brunei citizens to travel abroad, and enforcement of the Infectious Diseases Act and its regulations. The Ministry of Health also took measures to temporarily prohibit large or mass gatherings such as attending and visiting weddings, dining in at restaurant, sports events and even national, annual celebratory events. This includes the prohibition of the public to attend weekly prayers at mosques.

The Brunei Prime Minister's Office and Ministry of Education has also introduced work from home (WFH) measures and study from home measures from schools, colleges and universities. The actions of the Brunei Ministry of Health with the support of other Brunei ministries and departments in implementing swift and decisive measures resulted in astounding near elimination of the COVID-19.

Specifically, the highlight of the success is the suppression of 99.3% of COVID-19 cases in Brunei in only 2 months. Additionally, Brunei saw the end of active COVID-19 cases in under 11 weeks. There were only a maximum of 3 critical cases at any given time and only 2 COVID-19 related deaths throughout the outbreak. It is believed that if the Brunei government had not taken these prompt measures at the time, Brunei may not have seen the success in controlling the spread of the virus it sees now.

### **Conclusion:-**

As of 28 May 2020, there is only 1 case left in Brunei that is being treated in critical condition at the intensive care unit. There has not been any new cases in the country for over 3 weeks and it looks like this trend will continue for the foreseeable future. The only possibility of a second wave would likely come from another overseas infection into Brunei. However, Brunei has imposed restrictions on foreign travel into the country including initial and mandatory quarantines for travelers who have permission to enter the country.

Hence, there is a high unlikelihood of a second outbreak of COVID-19 in Brunei unless Brunei was lax with the travel and quarantine restriction. As such, Brunei is virtually free of the COVID-19 virus at present. Brunei is currently seeing the strategic reopening of public venues in the countries. Much of this credit is mainly due to the vigilant efforts of the Brunei Ministry of Health and other government offices.

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