

# Surge Capacity Dynamics at a COVID-19 Designated Hospital in Malaysia

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## Introduction

Building surge capacity for anticipated admission of COVID-19 patients during a community-wide outbreak of the coronavirus disease is a critical part of hospital preparedness strategy. Modelling systems are useful for testing of preparedness decisions. This study analysed predicted daily bed requirement, actual admissions and disease dynamics at a COVID-19 designated hospital.

## Methodology

Bed utilisation for RT-PCR confirmed and Person Under Investigation (PUI) for COVID-19 at Hospital Sungai Buloh (HSgB) was recorded from January to May 2020. Total daily admissions of new confirmed cases, PUI cases and bed availability were compared with total new COVID-19 cases nationally. The correlation between demand and available bed capacity was calculated against COVID-19 transmission dynamics in the country.

## Results

The surge and peak of PUI cases occurred about 19 days and 35 days, respectively (Fig.1). The trend reflected the national COVID-19 daily cases detected from contact tracing and screening strategies.

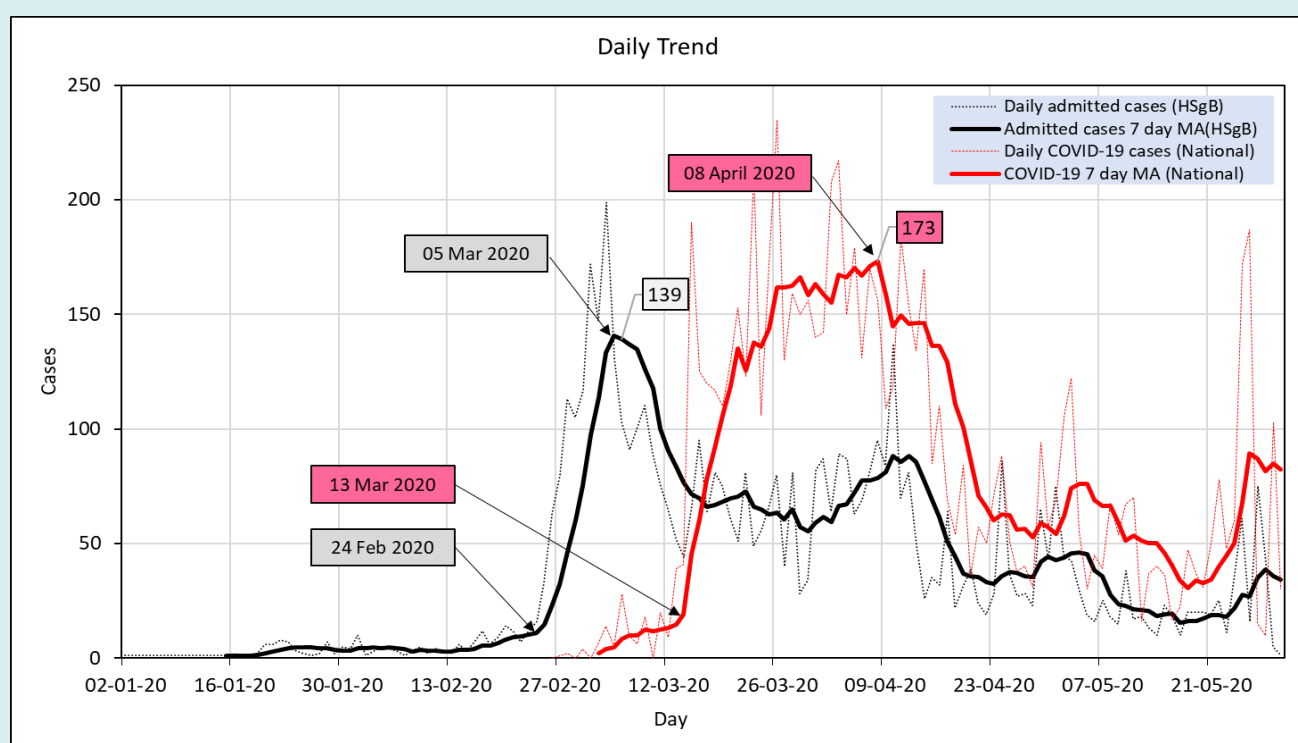


Fig. 1: Daily Trends of PUI in HSgB and COVID-19 cases in Malaysia

HSgB admitted 2566 females (44.5%) and 3194 males (55.5%), comprising 4676 (82.5%) Malaysians and 994 (17.5%) non-Malaysians. PUI cases accounted for 58.0% of total admissions (Table 1).

Table 1: Demographic Characteristics of COVID-19 and PUI Cases Admitted to HSgB

Total	COVID-19 N (%)	PUI N (%)
<b>Age, median (min, max)</b>	34.0 (0, 94.5)	30.8 (0, 96.4)
<b>Age groups</b>		
≤ 10	73 (3.1)	339 (10.3)
11 – 20	249 (10.4)	234 (7.1)
21 – 30	662 (27.8)	924 (28.1)
31 – 40	454 (19.0)	690 (21.0)
41 – 50	289 (12.1)	287 (8.7)
51 – 60	304 (12.8)	233 (7.1)
61 – 70	198 (8.3)	191 (5.8)
≥ 71	155 (6.5)	388 (11.8)
<b>Gender</b>		
Female	764 (30.9)	1802 (54.8)
Male	1710 (69.1)	1484 (45.2)
<b>Nationality</b>		
Malaysian	1709 (71.7)	2967 (90.3)
Non-Malaysian	675 (28.3)	319 (9.7)

COVID-19 bed capacity was planned ahead of time from an initial 28 designated beds out of total 620 beds available in the main hospital complex; before expanding to a total of 2069 beds, inclusive of beds created at satellite hospital and training institute. The bed activation was ahead of active cases admitted to HSgB (Fig. 2).

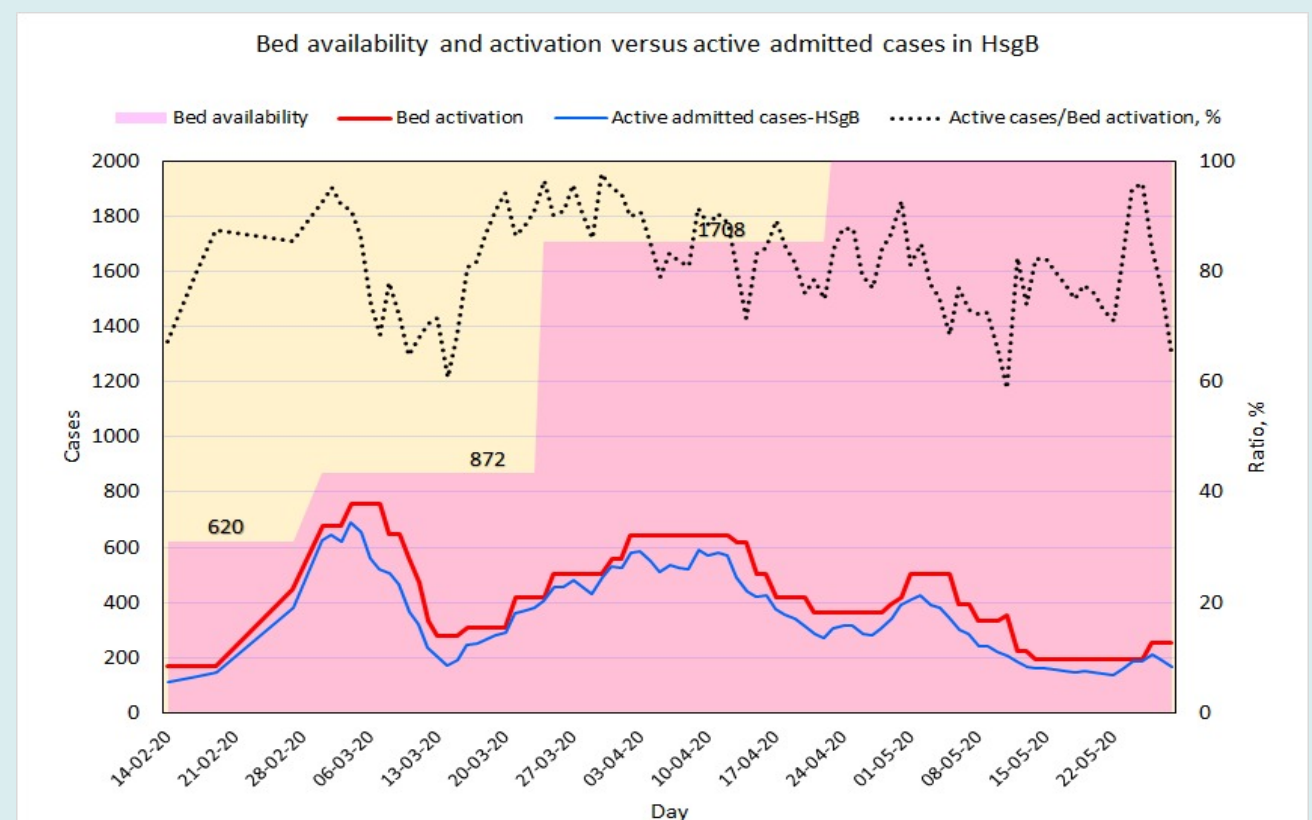


Fig. 2: Bed Availability and Activation vs. Active Case Admitted to HSgB

There was high correlation ( $r=0.998$ ) between national cumulative COVID-19 cases and hospital admission (Fig. 3).

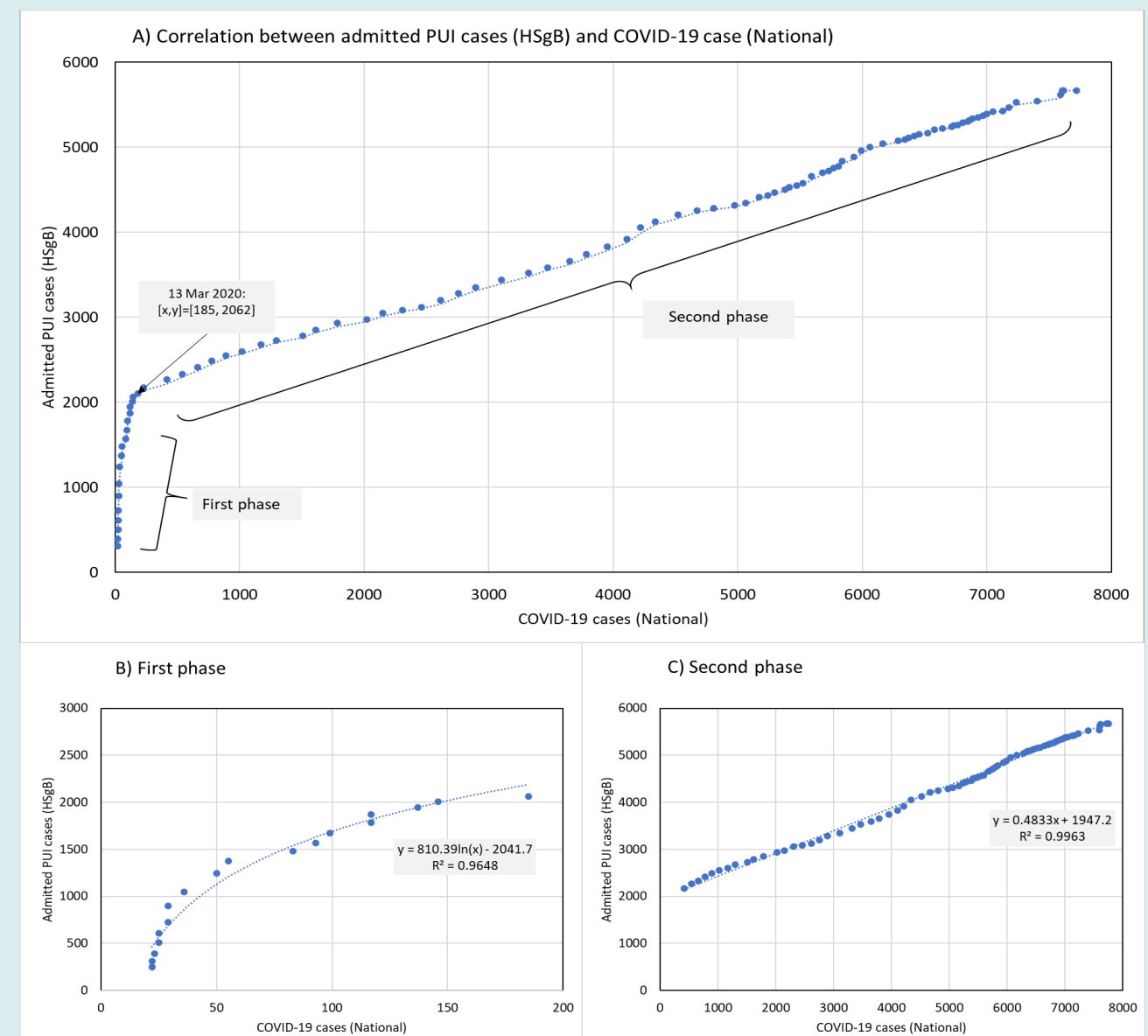


Fig. 3(A): Correlation between cumulative cases of PUIs admitted to HSgB and COVID-19 cases at national level, (B) Graph of admitted PUI cases to HSgB against COVID-19 cases at national level before movement control order (MCO), (C) Graph of admitted PUI cases to HSgB against COVID-19 cases at national level during MCO

## Conclusion

Hospital bed capacity was suitably expanded to time for the surge of COVID-19 admissions.

## Acknowledgement

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## References

- WHO. (2020). *Rolling updates on coronavirus disease (COVID-19)*. Retrieved March 24, 2020, from World Health Organization: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>
- Chopra, V. et al. (2020) 'How Should U.S. Hospitals Prepare for Coronavirus Disease 2019 (COVID-19)?', *Ann Intern Med.* Available at: <https://doi.org/10.7326/M20-0907>. *Ann Intern Med.* Available at: <https://doi.org/10.7326/M20-0907>.
- Hick, J. L. et al. (2020) 'Duty to Plan: Health Care, Crisis Standards of Care, and Novel Coronavirus SARS-CoV-2', *NAM Perspectives*. doi: 10.31478/202003b.
- Ministry of Health Malaysia (2020) *Latest Updates on COVID-19, Ministry of Health, Malaysia*. Available at: <http://www.moh.gov.my/index.php/pages/view/2019-ncov-wuhan>.
- Sungai Buloh Hospital (2020). Available at: <https://hsbuloh.moh.gov.my/index.php/ms/>.