

Descriptive study of changes to cardiovascular healthcare resource-use recorded in Malaysian real-world data from the Syntium database before, during, and after the COVID-19 pandemic

Beecroft S<sup>1\*</sup>, Franco-Sierra ND<sup>1</sup>, Kadiman S<sup>2</sup>, Sundararaman G<sup>1</sup>, Zarkadakis G<sup>1</sup>, Hall GC<sup>3</sup>

1 New York  
2 Kuala Lumpur  
3 London

BACKGROUND

- The COVID-19 pandemic is reported to have had a substantial impact on the diagnosis and treatment of several clinical conditions as a result of stay-at-home orders, avoidance of healthcare facilities, or reassignment of medical staff.
- In cardiovascular care, the number of patients undergoing certain surgical procedures has been reported to have declined over the period<sup>1,2</sup> while less invasive alternatives were performed more frequently.<sup>3</sup>
- Much of this information was derived from western countries.

1. Parcha V, et al. JTCVS Open 2021;6:132-43. doi: <https://doi.org/10.1016/j.jxon.2021.03.016>;  
2. Martin GP, et al. Circulation: Cardiovascular Interventions 2021; 14(5):e010413.  
3. Kite TA, et al. Catheterization and Cardiovascular Interventions 2022; 99(2):305z-13.

OBJECTIVES

- To investigate changes in cardiovascular healthcare resource use over the study period in a non-western setting, specifically:
  - Was there a shift from Coronary Artery Bypass Surgery (CABG) to Percutaneous Transluminal Coronary Angioplasty (PTCA) in adults during the pandemic?
  - Was there a change in oral anticoagulation during the pandemic to treatments which required less hospital monitoring?
  - Was there a change in outpatient attendance during the pandemic in paediatric or adult populations?

METHODS

Study Design and Data Source

- An observational, descriptive study of real-world data from January 2019 to December 2022 inclusive (study period).
- All data came from the Syntium database of electronic healthcare records from a specialist Malaysian tertiary care cardiovascular and thoracic institution. The database comprises records on all outpatient and inpatient contacts for 400,000 patients and over 5 million treatment episodes.
- The institution remained a cardiovascular unit throughout the pandemic, although patients may have been transferred from other centres. Foreigners were excluded from the study to avoid bias due to travel restrictions.

Study Population by objective

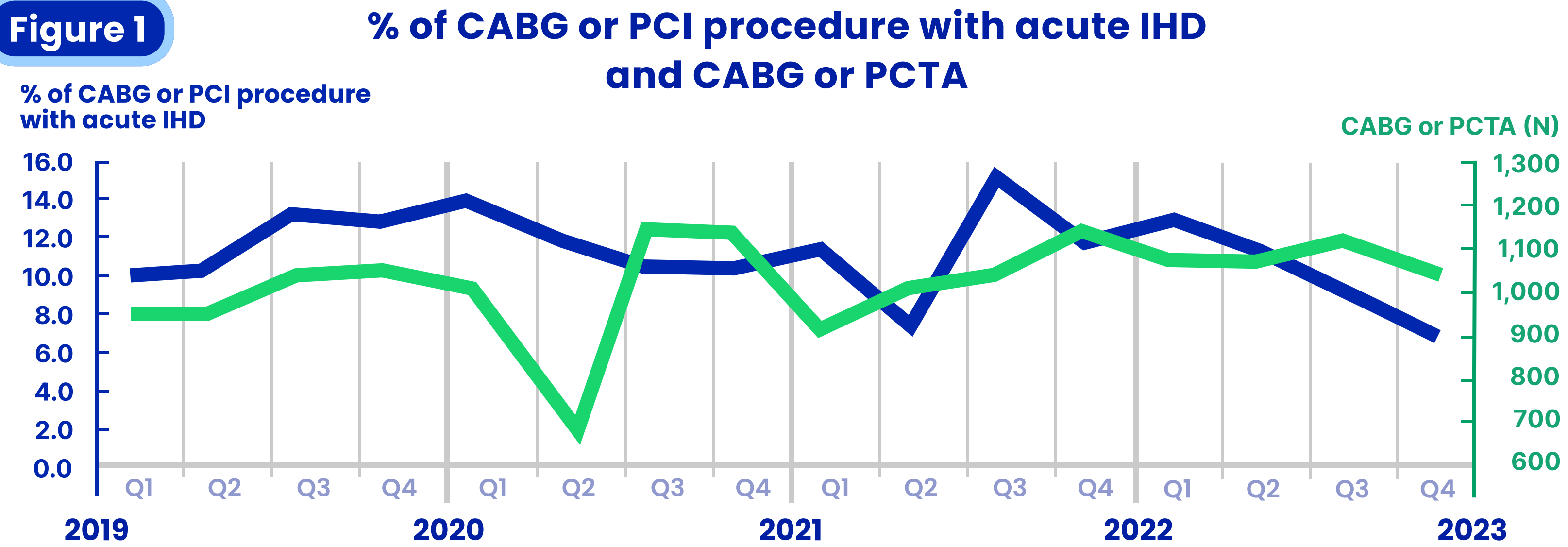
- Objective 1: all patients with >1 discharge from admitted care dated in the study period and with a code for either CABG or PTCA dated during that admission when they were >18 years of age.
- Objective 2: all patients with a first record of anticoagulation with either warfarin or a non-vitamin K antagonist (NOAC) at a discharge dated in the study period. All age groups were included.
- Objective 3: all patients with at least one outpatient attendance dated during the study period.

Analysis

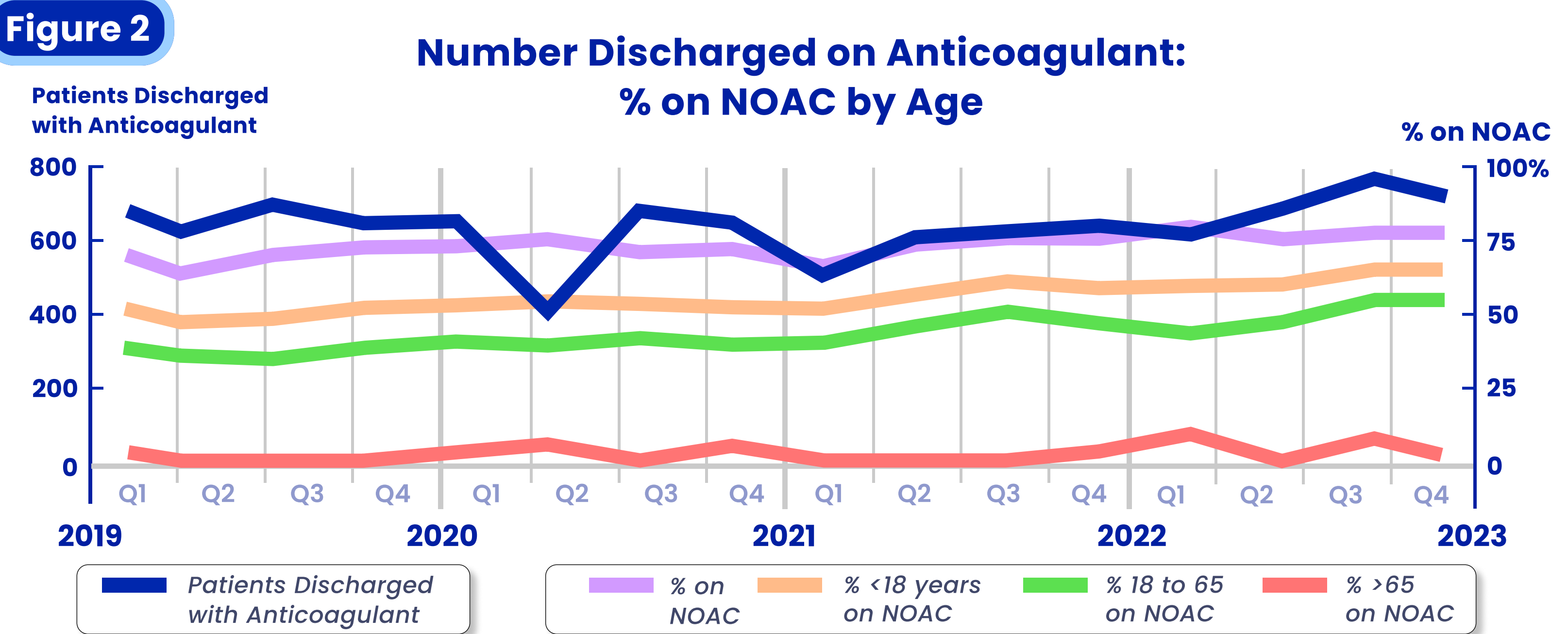
- Descriptive analyses were repeated for each calendar quarter in the study period.

RESULTS

- The database included >880,000 patient contacts during the study period.
- A drop in the number of adult coronary artery procedures (CABG and PCTA) was seen in Q2 2020 and Q1 2021, with an increase in procedures between these dates (Figure 1).
- The majority of procedures were PCTA (>90% throughout the study period), a proportion which increased gradually over time but remained fairly consistent during the pandemic period (93.2% to 95.2% from Q1 to Q2 2020).
- A drop in acute ischaemic heart disease (ICD-10 code I21, I22 or I24) in the 72 hours prior to the coronary artery procedure at the beginning of the pandemic continued into Q2 2021 (Figure 1).



- The total number of discharges with any anticoagulation dipped in Q2 2020 and Q1 2021. The use of NOACs at discharge gradually increased over the study period but no movement from warfarin to NOACs was identified in 2020 (Figure 2). Anticoagulation was rare in children (n=8 over the study period).



- Outpatient attendances dipped in Q1 2020. A parallel dip in the percentage of paediatric patients who had an echocardiogram did not return to pre-COVID-19 levels (Table 1).

| Table 1                                | 2019   |        |        |        | 2020   |        |        |        | 2021   |        |        |        | 2022   |        |        |        |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|  | Q1     | Q2     | Q3     | Q4     | Q1     | Q2     | Q3     | Q4     | Q1     | Q2     | Q3     | Q4     | Q1     | Q2     | Q3     | Q4     |
| People who attended (outpatients OP) N | 52,639 | 52,745 | 54,279 | 55,034 | 52,315 | 49,527 | 56,184 | 53,711 | 53,194 | 53,078 | 53,587 | 55,869 | 54,170 | 54,526 | 55,789 | 56,013 |
| OP attendances N                       | 73,446 | 74,138 | 77,964 | 78,280 | 73,394 | 66,416 | 80,235 | 75,527 | 74,408 | 73,410 | 75,285 | 82,801 | 78,299 | 80,626 | 81,518 | 81,535 |
| % with an ECHO All ages                | 6.8    | 6.5    | 6.4    | 7.1    | 5.9    | 4.6    | 7.3    | 6.0    | 5.2    | 5.4    | 5.1    | 6.3    | 6.4    | 5.7    | 5.7    | 5.6    |
| % with an ECHO <18 years               | 71.0   | 71.3   | 68.5   | 70.8   | 66.9   | 65.8   | 69.8   | 65.5   | 66.0   | 64.2   | 54.1   | 64.8   | 67.6   | 65.0   | 60.6   | 61.6   |
| % with an ECHO 18-65 years             | 6.8    | 6.3    | 6.5    | 7.6    | 6.2    | 4.3    | 7.7    | 6.2    | 4.7    | 5.3    | 5.1    | 7.0    | 6.7    | 6.0    | 6.4    | 6.3    |
| % with an ECHO >65 years               | 2.0    | 1.6    | 1.5    | 1.4    | 1.4    | 1.2    | 1.9    | 1.6    | 1.4    | 1.6    | 1.6    | 1.8    | 1.6    | 1.7    | 1.5    | 1.5    |

CONCLUSIONS

- Changes in cardiac HCRU were seen during the pandemic. Levels generally then returned to normal.
- Patients transferred from COVID-19 treating hospitals could account for the temporary increase in the number of coronary artery procedures in Q3-Q4 of 2020 following the drop at the beginning of the pandemic in Q2 2020. This could also account for the lower proportion with a recent acute ischaemic event.
- The percentage of anticoagulation at discharge with a NOAC did not increase during the pandemic despite this therapeutic group requiring less healthcare contact than warfarin.
- The continued lower rate of echocardiograms per outpatient in paediatrics warrants further investigation.



**SYNDESIS HEALTH**  
syndesis.com



CONTACT:  
**Sue Beecroft**  
Chief Commercial Officer  
sue.beecroft@syndesis.com