

### **Project Title**

Deployment of antimicrobial and sporicidal disposable curtains to A&E, Peri-Ops and SOC in Khoo Teck Puat Hospital

### **Project Lead and Members**

Project Lead(s): Kong Lee Wei

Project Members: Alice Leong, Foo Meow Ling, Noribah Bte Abdul Rahman, Koh Lih Kian, Kee Tat Chuan

### **Organisation(s) Involved**

Khoo Teck Puat Hospital

### **Healthcare Family Group(s) Involved in this Project**

Medical, Nursing

### **Applicable Specialty or Discipline**

Infectious Disease

### **Project Period**

Start date: March 2020

Completed date: May 2022

### **Aim(s)**

Linen Services was facing a huge challenge of high curtain changing frequency and this was exacerbated by manpower shortage and increasing operating cost. The situation further worsened with the onset of Covid-19 pandemic. Curtain changing frequency had since doubled while manpower situation was further impacted due to government policies and border control restrictions.

Disposable curtain with antimicrobial and sporicidal functions were introduced as safe alternative. This chemical treated disposable curtain is clinically proven to inhibit the growth and reproduction of bacteria, viruses and spores.

### **Background**

See poster appended/ below

## **Methods**

See poster appended/ below

## **Results**

See poster appended/ below

## **Lessons Learnt**

See poster appended/ below

## **Conclusion**

See poster appended/ below

## **Additional Information**

See poster appended/ below

## **Project Category**

Care & Process Redesign, Value Based Care, Productivity, Time Saving, Cost Saving, Safe Care, International Patient Safety Goals

## **Keywords**

Nosocomial Infection, Antimicrobial, Sporicidal, Safe Environment, Chemical-Treated, Disposable Curtain, Contamination, Infectious Risk

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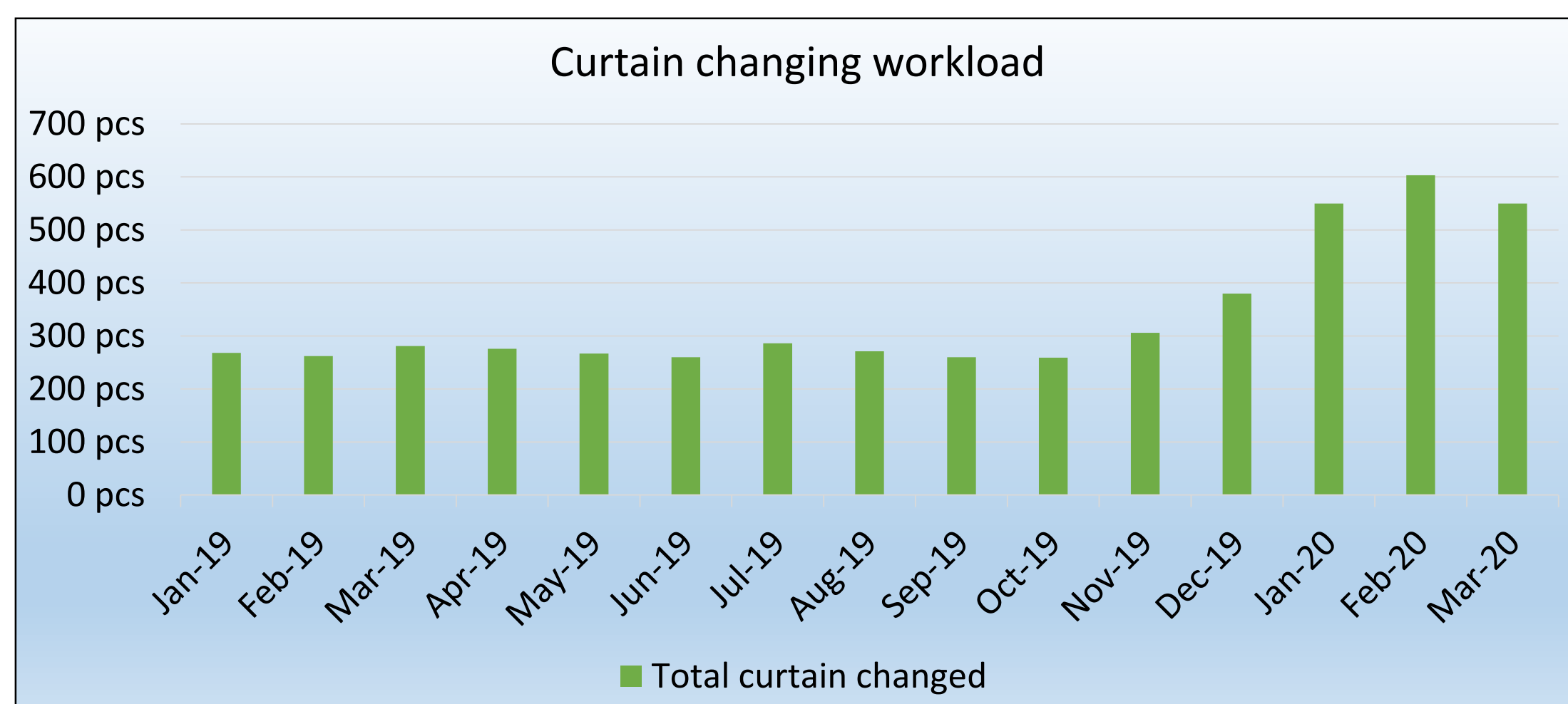
# Deployment of antimicrobial and sporicidal disposable curtains to A&E, Peri-Ops and SOC in Khoo Teck Puat Hospital

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## 1 Introduction and background

Reusable curtains in A&E, SOC & Peri-Ops areas were needed to be changed after the discharge of each infectious case to mitigate the risk of nosocomial infection. The **increased curtain changing frequency** required during the initial onset of Covid-19 pandemic had further worsened the manpower shortage situation in the hospital due to government policies and border control restrictions that had stopped all cross border movement.

Graph A shows the curtain changing workload had increased 102% during the onset of Covid-19 pandemic comparing the average workload during peace time in year 2019.



Graph A: Curtain changing workload

In addition, the **increased laundry cost** of these curtains had further driven up the department's operating budget which was not sustainable in the long run. There existed an **inherent risk of cross contamination** during the transportation and laundry process as handling staff could be exposed to the pathogen and thus infected by the virus and bacteria.

On top of that, there was **risk of fall** from height while changing the reusable curtains. As the reusable curtain weighs about 4kg per piece, the heavy reusable curtain may cause staff doing the change, to lose their balance while carrying the curtain and climbing the ladder.

## 2 Methodology

Disposable curtains with **antimicrobial and sporicidal** functions were introduced as a safe alternative to the existing reusable curtains without compromising on patients' privacy.

A 12-month trial had been conducted at MOT in collaboration with nursing and hospital infection control team to **validate its efficacy** from September 2019. There were no organisms detected. The initial deployment of disposable curtains had started in March 2020 at EDTU amidst the pandemic and 6 months from MOT's study.

The chemical-treated disposable curtain is able to inhibit the growth and reproduction of bacteria, virus and spores that landed on the curtain surfaces. This was supported by lab test results using the swab samples collected from the disposable curtain used in EDTU and MOT, PACU Bed 20 (MRSA Bed). **No microbial growth were detected** on the swab samples.

To strengthen the business case, the effective usability duration of antimicrobial and sporicidal curtain is longer than traditional fabric curtain that were being used.

**Changing frequency** had since been **reviewed and reduced** according to the traffic flow and infectious risks of the respective areas. Table A shows the curtain changing frequency for both reusable curtains and disposable curtains.

Location	Frequency of Change	
	Reusable Curtains	Disposable Curtains
A & E	Monthly	Half yearly
EDTU	Monthly	Quarterly
DDR	Monthly	Annually
MOT	Monthly	Annually
DSOT	Monthly	Annually
Endoscopy	Monthly	Annually
SOC	Monthly	Annually
High Risk Areas e.g. treatment rooms (DDR and SOC), procedure rooms (Endoscopy) and Lily Rooms (A & E)	Weekly or upon request	Quarterly

Table A: Curtain changing frequency

Lastly, the weight of disposable curtain is **lighter by 50%** compared to reusable curtains. The **risk of fall** from height for staff has thus **greatly reduced**.

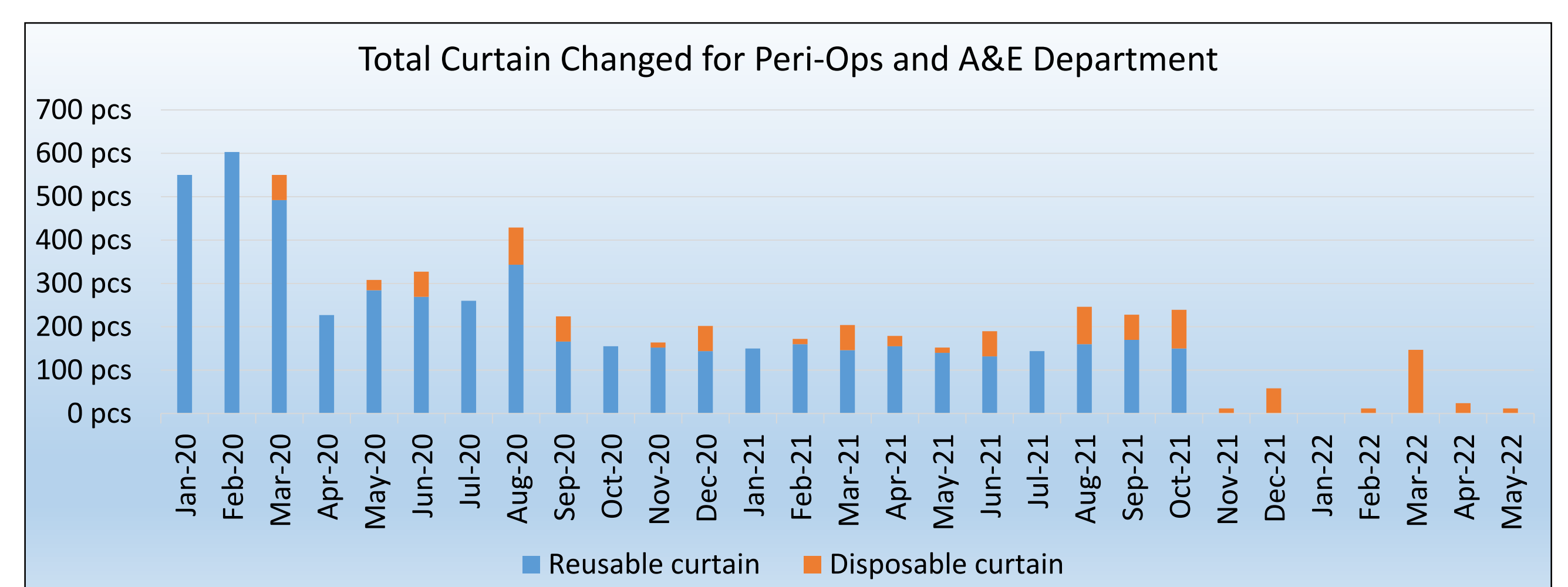
## 3 Result and project impact

The deployment of antibacterial and sporicidal disposable curtain was first initiated in Extended Diagnostic Treatment Unit (EDTU) during the Covid-19 pandemic in March 2020.

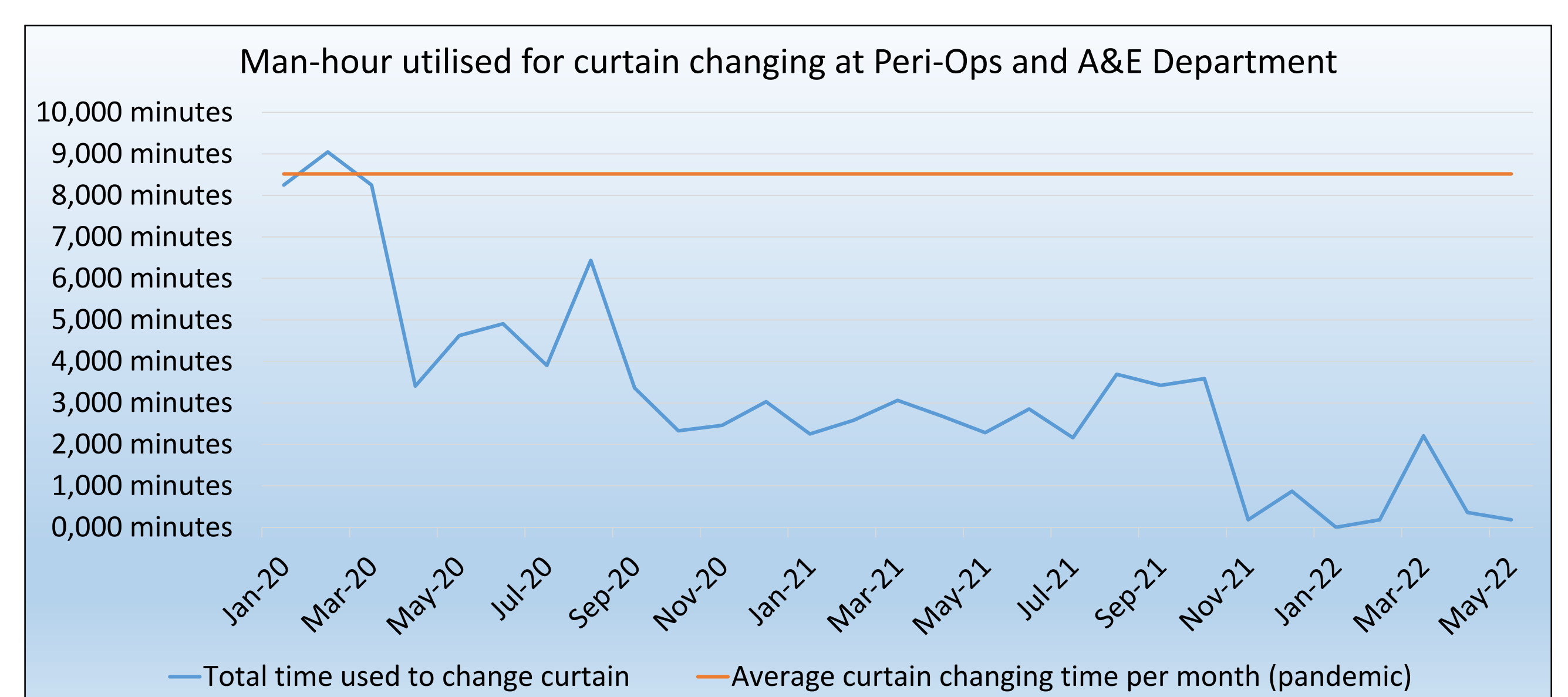
Following the success in EDTU, Peri-Operatives departments such as MOT, DSOT, Endoscopy Centres and DDR followed suit in September 2020 to also roll out the deployment of antibacterial and sporicidal disposable curtains to their clinical areas while full deployment at Acute and Emergency Department (A&E) completed in October 2021.

Data ranging from January 2020 to May 2022 were collated to measure the success and effectiveness of the project. As the pandemic situation evolved with time, actual curtain changing workload and curtain usage from January to March 2020 was used as baseline data.

An immediate **workload reduction** was observed. Graph B shows the total curtain changed per month for both reusable and disposable curtains. While Graph C shows the man hours utilised to perform the curtain changing task. The curtain changing workload had reduced **49% in Q2 2020** comparing to Q1 2020. The total workload had further reduced **91% in Q1 2022**. No nosocomial infection cases were reported during this period.



Graph B: Total curtain changed from January 2020 to May 2022



Graph C: Total man-hour for the curtain changing task

Overall, **2,578 man-hours were saved** for Environmental Services Department. Saved manpower were deployed for other cleaning task. This is crucial during the manpower crunch resulted from the restricted border movement.

On top of that, cost for laundry, disposal, manpower as well as the curtain cost were monitor closely during the implementation of the projects. A total **cost saving of \$128,548.60** were achieved over 27 months from March 2020 to May 2022.

## 4 Sustainability and follow up

The deployment of disposable curtain has been incorporated into the routine curtain changing work flow since March 2020. Extension of deployment to Specialist Outpatient Clinics are in the pipeline and target to be completed by FY 2022.

With the next planned deployment of these chemical-treated disposable curtains to Specialist Outpatient Clinics in Q3 FY 2022, the achievable cost & manpower savings are expected to rise up even further.

Total cost saving is **estimated at \$97,876.00 per annum** once Specialist Outpatient Clinics deployment of antimicrobial and sporicidal curtain is completed.

## 5 Conclusion

The antibacterial and sporicidal disposable curtain provide protection to all patients, staff and visitors accessing the clinical areas. It brings **financial benefits** to the organization by **eliminating the laundry process** and **reducing the labor cost** to remove and rehang the curtain. The other is the **safety advantage** for staff changing the curtain, as the ladder climbing frequency had reduced and the disposable curtain is 50% lighter.

The implementation of antimicrobial and sporicidal curtain in Khoo Teck Puat Hospital is proven effective from both cost-effectiveness and safety perspective.

