Improving Operational Efficiency of Medication Delivery Services for Dermatology Outpatients

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Background and Context of Problem

- Medication Delivery Services (MDS) in National Skin Centre (NSC) is a service provided to NSC patients who preferred their medications to be delivered to their homes.

- During the COVID-19 circuit breaker, MDS requests increased exponentially within 2 months from 30 cases per month to 1,300 cases per day. However, the existing work space, manpower and other resources for both NSC and ALEX Fulfilment Services (courier partner) were designed to manage up to a maximum of 100 cases per day.

- MDS is accompanied by time-consuming, complex, manual processes affecting multiple stakeholders:
    a) Tedious manual processing of medication delivery requests
    b) Tedious manual processes of tallying large quantity of parcels
    c) Long waiting time of MDS processing experienced by patients
    d) Multiple complaints of late and erroneous medication deliveries
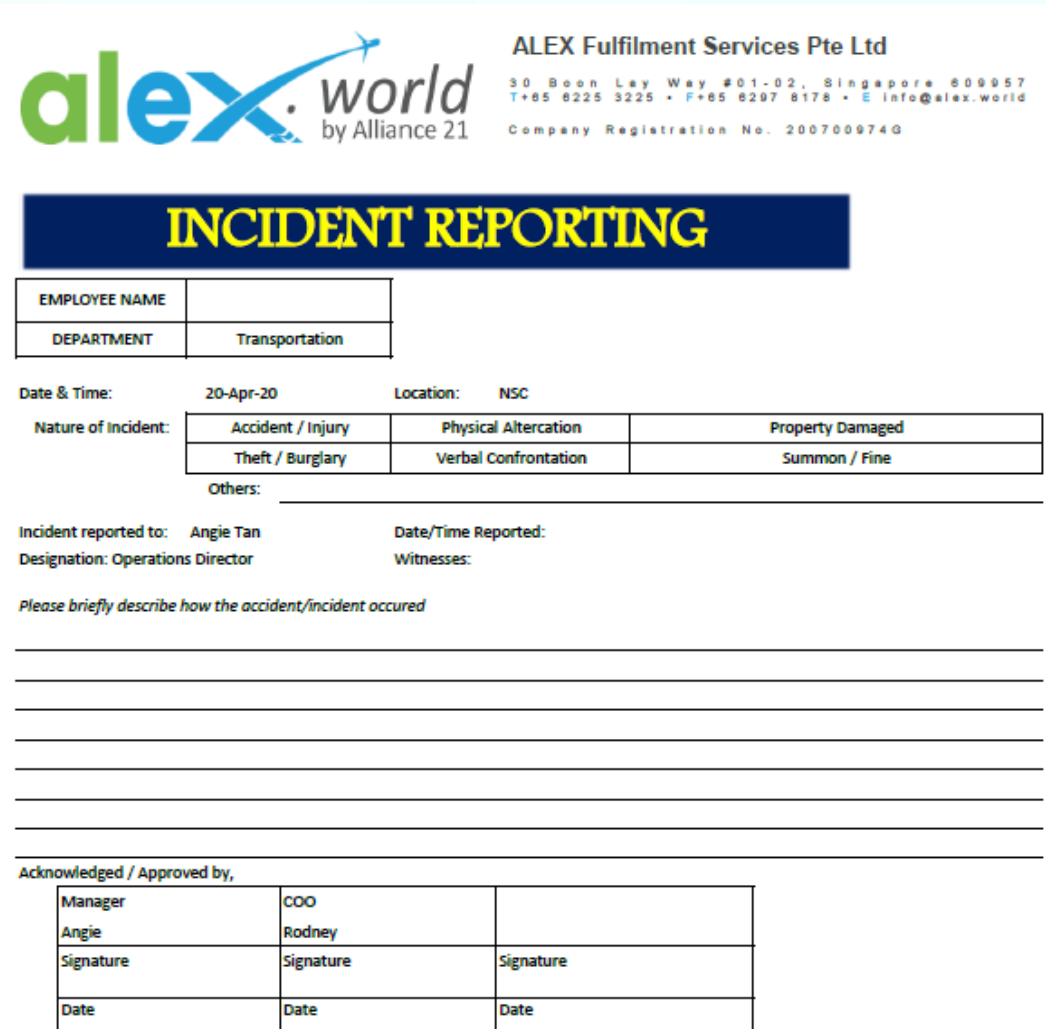   e) Multiple incident reports to investigate/rectify multiple recurring errors

Project Objectives

- To improve the operational efficiency of mediation delivery services (MDS) for dermatology outpatients in NSC
- To achieve zero MDS error rate for NSC and ALEX Fulfilment Services
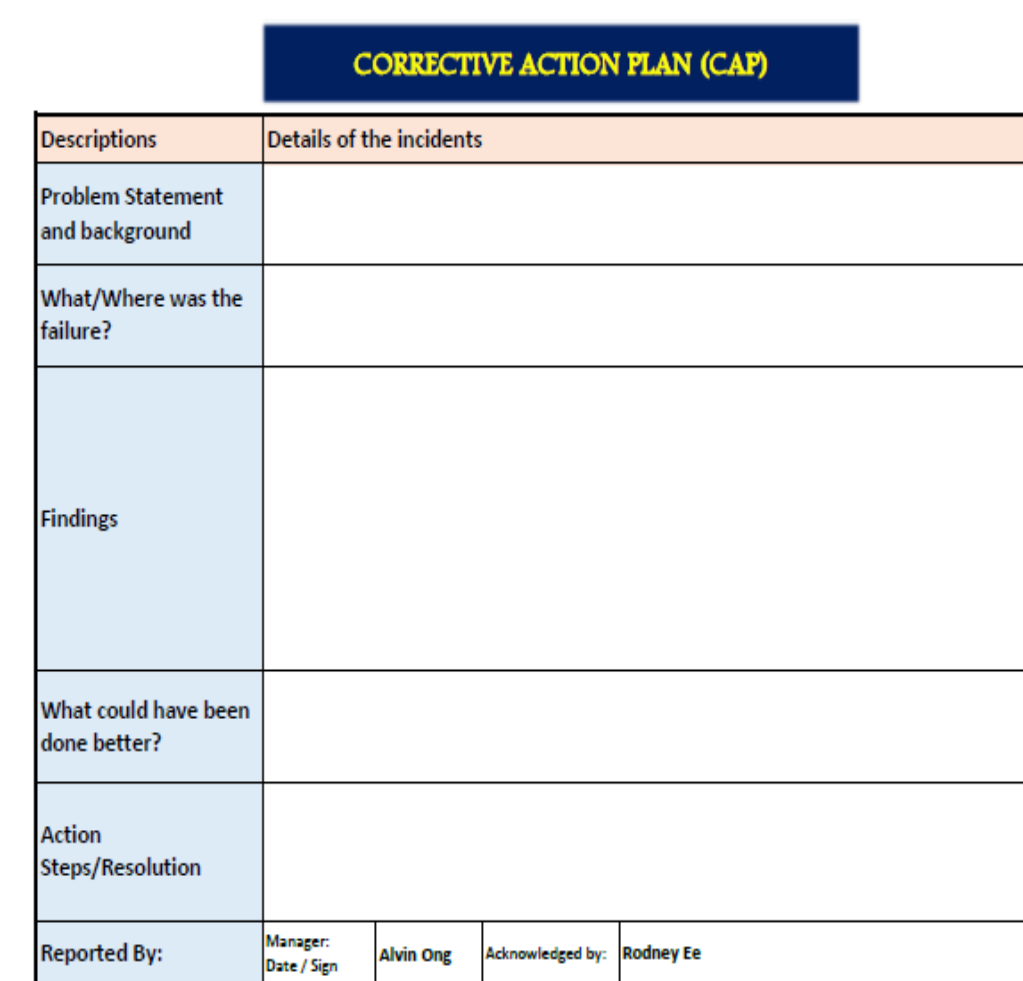
Methodology

- NSC Pharmacy and ALEX Fulfilment Services collaborated to streamline MDS processes using Kaizen Methodology and Digitalisation approach
- Improvement ideas were implemented to reduce mudas and muras in the MDS processes.
- Plan-Do-Study-Act (PDSA) was used to review their effectiveness (quantitative measures) and identify other areas for continuous improvement (qualitative inputs from patients and stakeholders).
- Key interventions include:
a) Collaborative workflow redesign with system thinking approach (upstream, downstream, concurrent processes) and human factors considerations
b) Incident Management Bundle (systematic incident analysis to prevent recurrence)
c) Digitalisation of MDS Parcel Journey with barcode verification technology
d) Conversion of complex manual processes to standardised/simplified and digital processes with sustained system-level improvement

Incident Management Bundle for Alex Fulfilment Services

ALEX staff verifying parcels using Barcode Verification Device during medication parcel pick-up
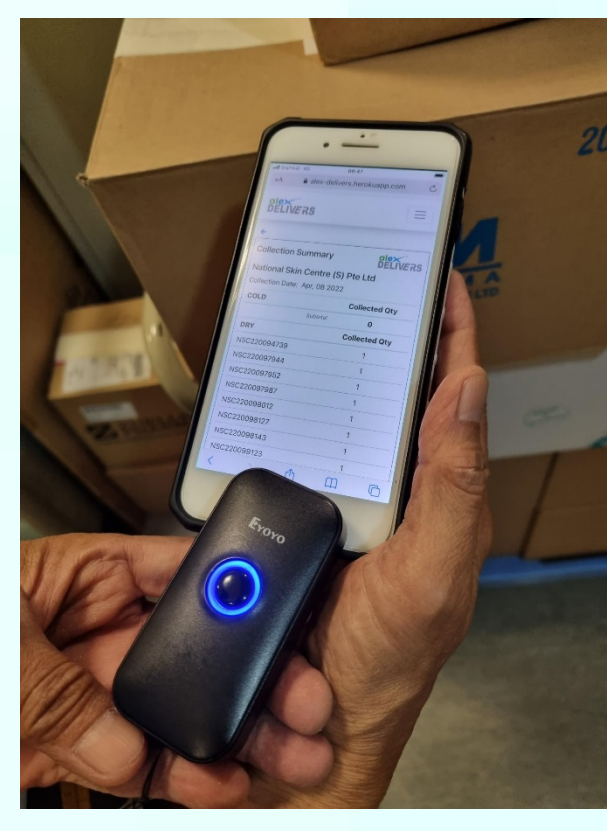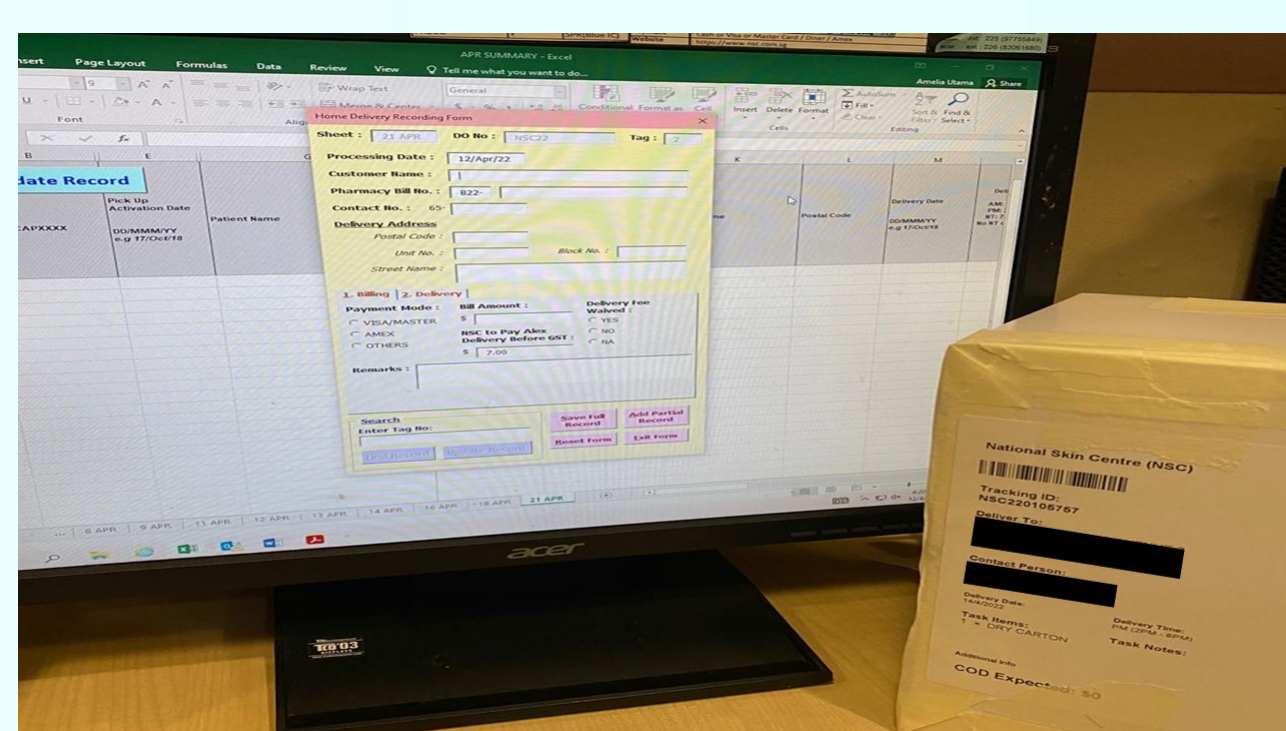

Barcode Verification Device for medication parcel pick-up
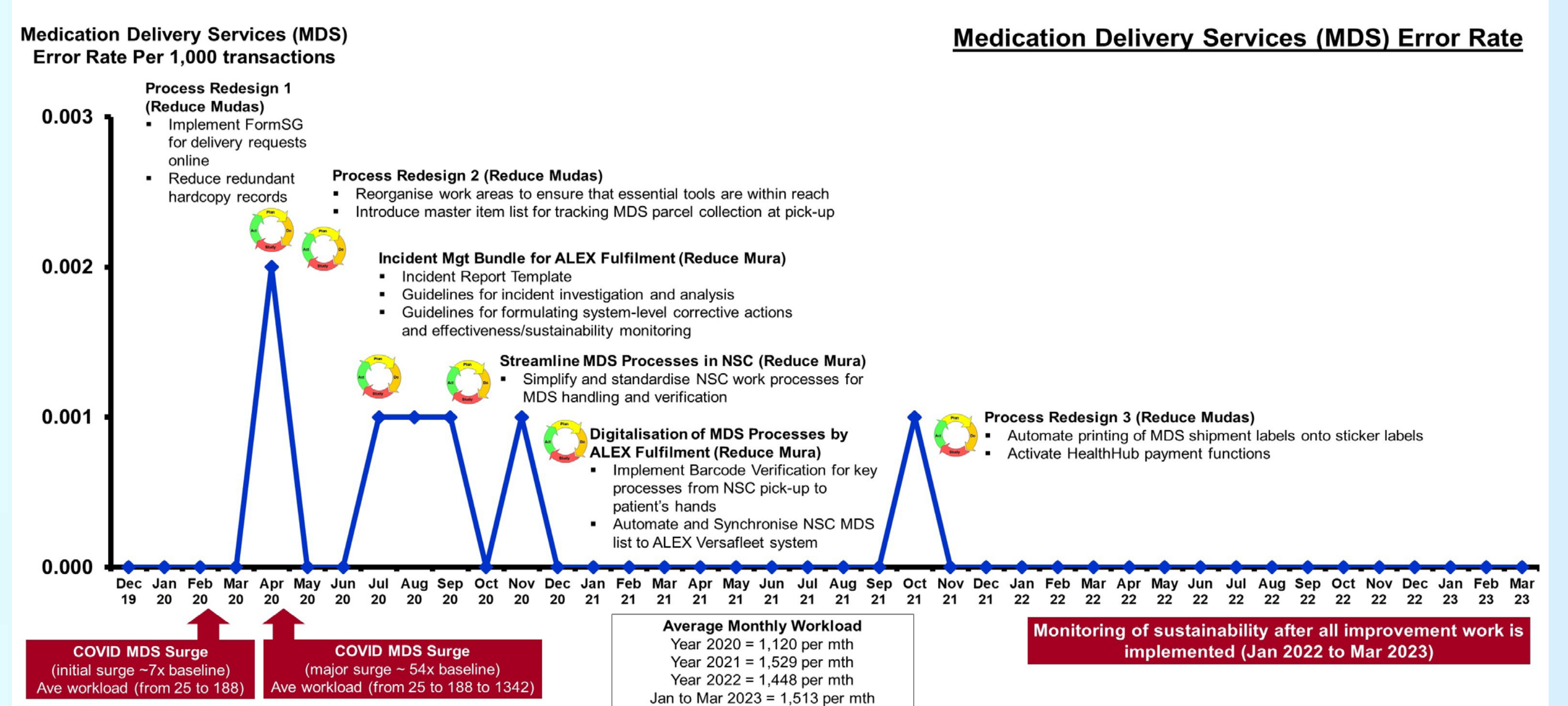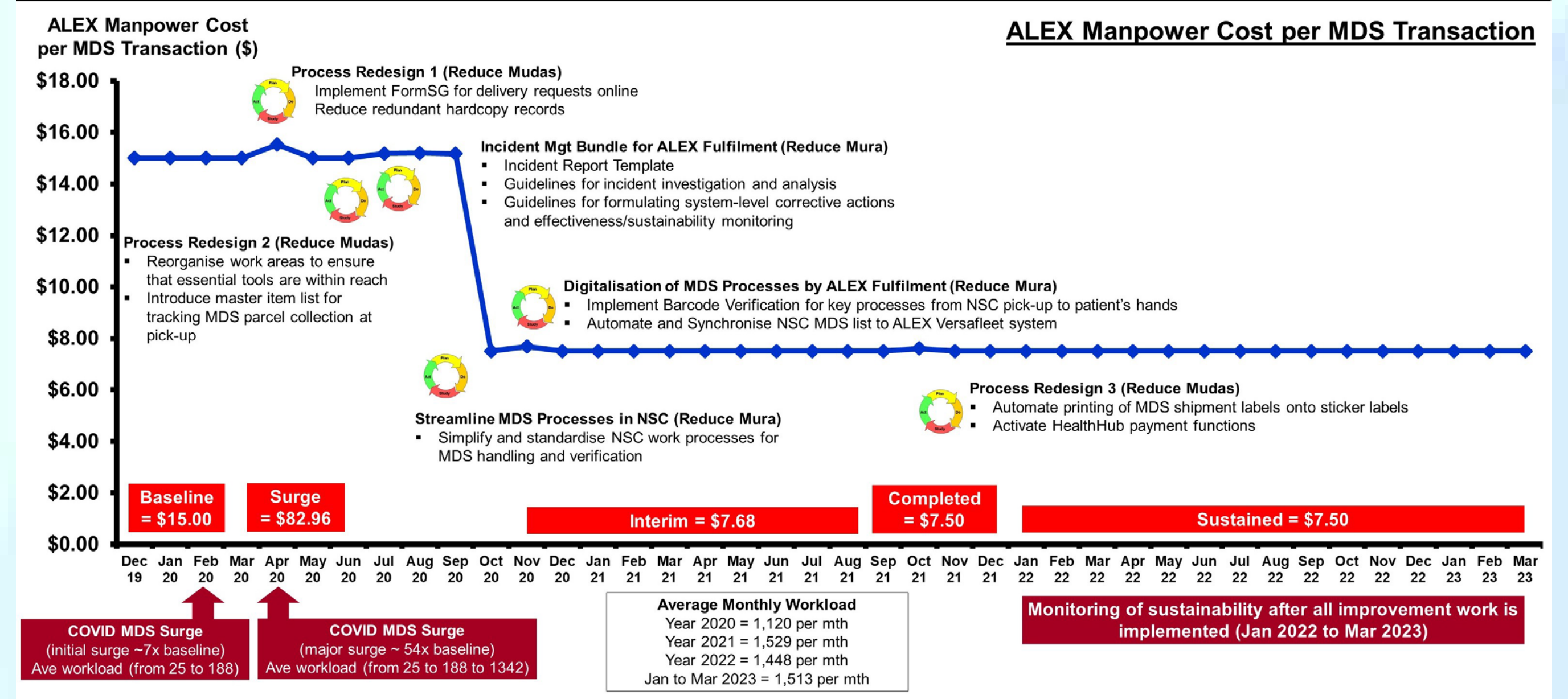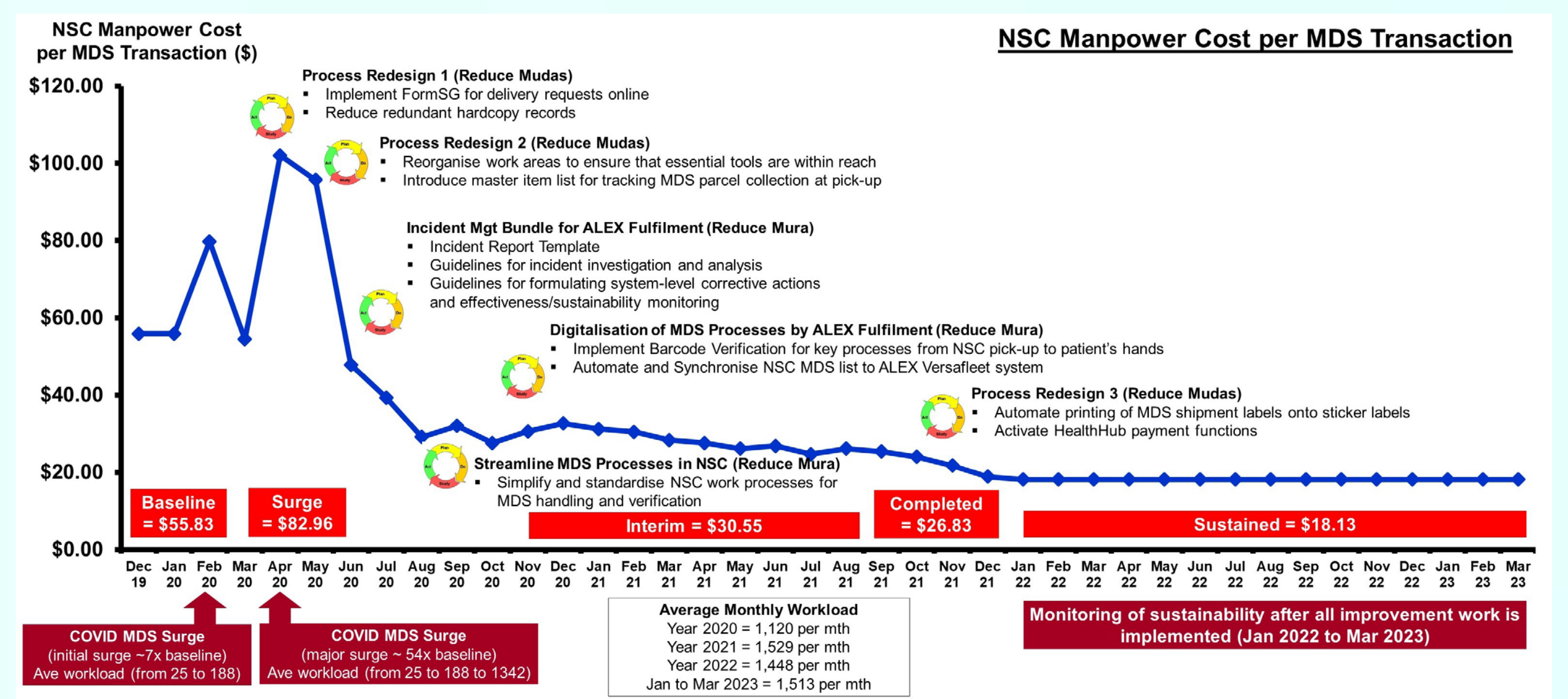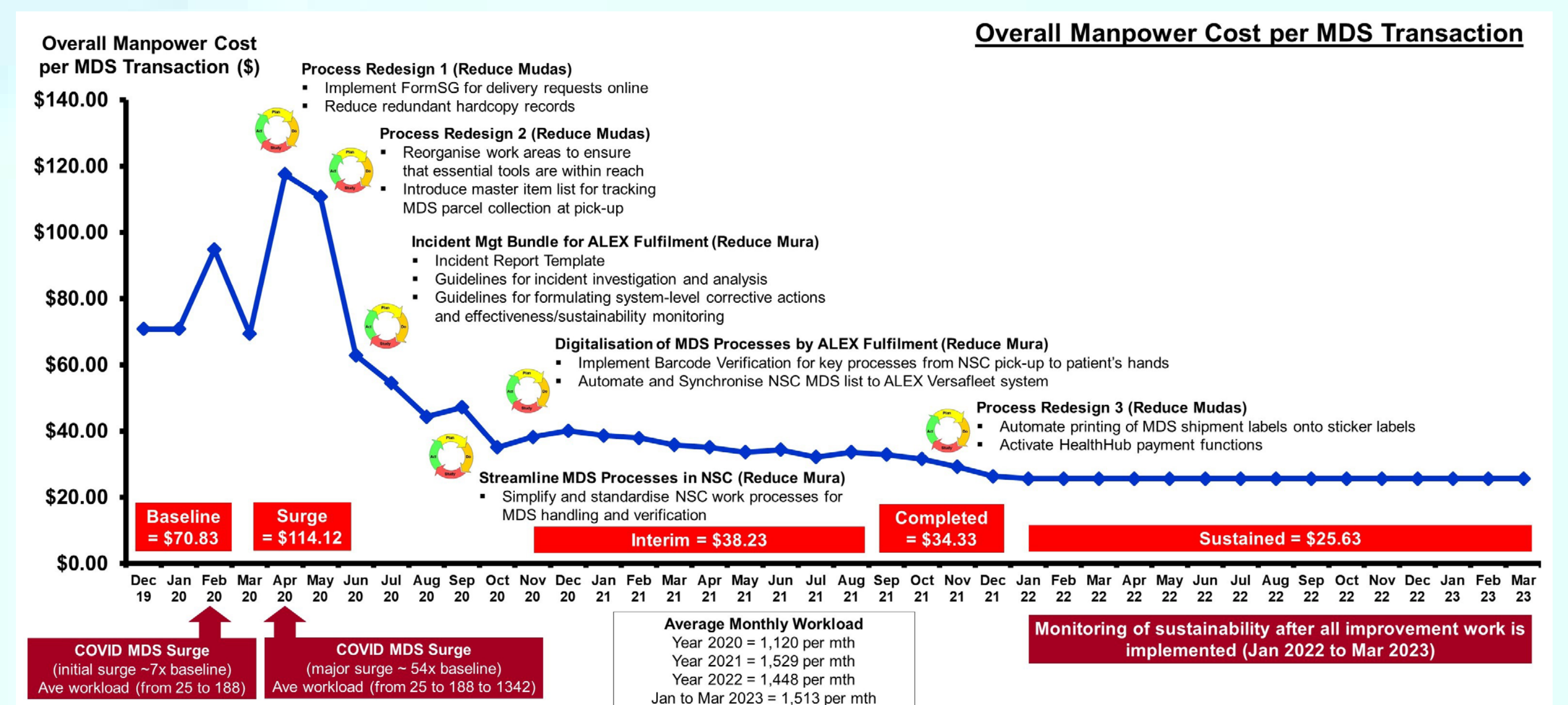
FormSG Medication Delivery Request Form

Automate in-house printing of MDS medication parcel shipment notes on sticky labels

Results

- From January 2020 to March 2023, the quantitative measures were monitored to determine the effectiveness and any potential adverse impact of the improvement actions during PDSA cycles.

Quantitative Measures (Project Outcomes)	Baseline Data (Dec 2019)	Project Completion (Dec 2021)	Sustained Improvement (till Mar 2023)
Average Manpower Cost per MDS Transaction; *(Target: 30% reduction)*	SGD 70.83	SGD 34.33 (↓51%)	SGD 25.63 (↓64%)
Manpower Costs (NSC) per MDS Transaction *(Target: 30% reduction)*	SGD 55.83	SGD 26.83 (↓52%)	SGD 18.13 (↓68%)
Manpower Costs (ALEX) per MDS Transaction *(Target: 30% reduction)*	SGD 15.00	SGD 7.50 (↓50%)	SGD 7.50 (↓50%)
MDS Error Rate (Per 1000 Transactions) *(Target: ≤1)*	1	1	0

Overall Manpower Cost per MDS Transaction

NSC Manpower Cost per MDS Transaction

ALEX Manpower Cost per MDS Transaction

Medication Delivery Services (MDS) Error Rate

Conclusion

- NSC Pharmacy and ALEX Fulfilment Services have sustained the improved operational efficiency of medication delivery services through our collaborative improvement partnership.
- This collaborative improvement project has resulted in sustained 64% reduction in overall manpower cost per MDS transaction and zero MDS error rate. Sustainability has been achieved since project completion.