

## **Project Title**

Implementation of mobile application for UVC treatment activation

## **Project Lead and Members**

Project Lead: Lee Shimin Sharon, Operations Executive, SGH

Project Members:

- Priscilla Wong Foong Ee, Senior Operations Executive, SGH
- Yamin Yuper Zin, Manager, Quality Assurance & Projects, ISS
- Vincent Tran Hoai Vi, Supervisor, ISS

## **Organisation(s) Involved**

Singapore General Hospital; ISS Facility Services Ptd Ltd

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

Healthcare administration

## **Applicable Specialty or Discipline**

Operations

## **Aims**

To implement a mobile and web-based application platform to facilitate the workflow of UV-C treatment activations

## **Background**

See poster appended/ below

## **Methods**

See poster appended/ below

## **Results**

See poster appended/ below

## Lessons Learnt

Participation in quality improvement, whether it is big or small improvement, improve the care our patients will receive holistically. With the increased Priority 1 cases due to COVID-19 in 2020 and 2021, the team workflow has benefitted greatly from the usage of mobile applications. Despite the surge of COVID-19 cases in Dec 2021 and Apr-Jun 2022, the team had managed to achieve our aim by keeping the median less than 7.5%.

Today, mobile phones have become an integral part of many individuals. The usage of mobile applications helps towards maintaining effective communication and data are tracked. Visual management is also customizable according to preferences, e.g. colours, fonts and categorization. The team's solution of an activation system using of mobile application paves the way for future possible mobile applications such as project cleaning activation.

Notwithstanding the external factors, the mobile application can be improved further to minimize human errors, interface design to be more appealing to elderly staff and for tracking of machine maintenance such as lamp hours.

## Conclusion

See poster appended/ below

## Additional Information

Quality Improvement is a continuous process and it is important to understand the process in-depth in order to use appropriate tools to find out the root causes and analyse the data to determine the results in a systematic order.

Data analysis to determine your aim may take a few tries to attain your goal. Don't be afraid to try again.

With the implementation of mobile applications to activate UV-C treatments, there are less missed-out cases and prompt UVC treatments are carried out. With that, the team are able to achieve enhanced disinfection in patients' rooms, ensuring a holistic

environmental care is provided for the patients. Our colleagues are also benefitted as they are able to safely enter a clean room for maintenance or for other matters.

**Project Category**

Technology, Digital Health, Mobile Health, Digital Apps

**Keywords**

Mobile Application, Service Activation, Reducing Lapses

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# Using of mobile application for UVC treatment activations

Team Leader: Sharon Lee (SGH ES), Asst Leader: Priscilla Wong (SGH ES),  
Members: Yamin Yuper Zin (ISS QA), Vincent (ISS Housekeeping)  
QI Coach: Leong Man Qing (SGH PTI)

## Background of the problem

UVC treatment is a supplementary decontamination process that is activated after completion of terminal cleaning to enhance disinfection. Inefficiencies in carrying out UVC treatment and missed treatments may compromise patient safety.

The activation of UVC treatment and updating of the status of ongoing and completed UVC cases are communicated by messaging through Whatsapp. There are often lapses in identifying and responding to activated priority cases, and response timings are further extended during peak hours when multiple cases were activated. Our project focuses on Priority 1 cases which refer to Transplant rooms, Candida Auris cases and outbreak of disease related cases (e.g. 2019-nCoV).

10% of Priority 1 cases are with response time >2hrs and some with response time up to 18 hours.

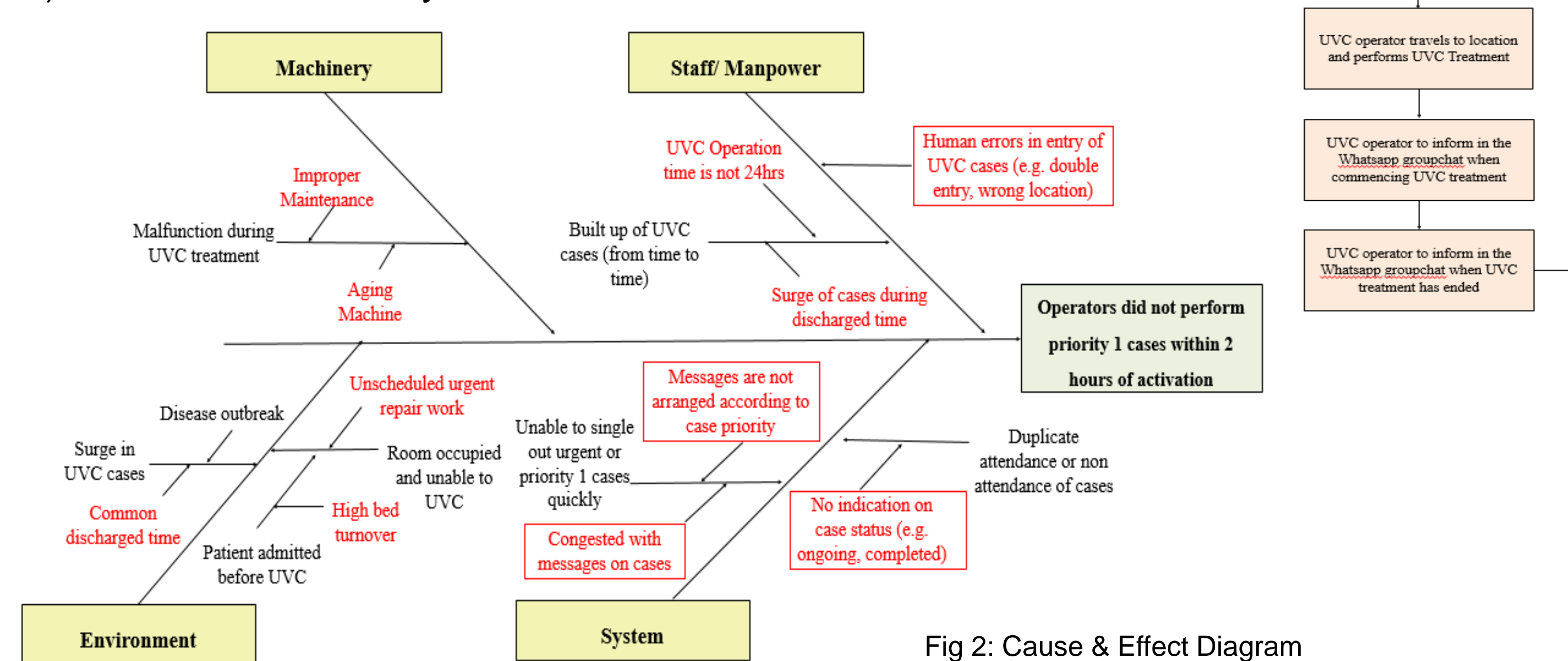
## Mission Statement

To reduce the median percentage of Priority 1 cases activated between 8am to 5pm with UVC operator response time more than 2hrs from 7.5% to less than 5% within 6 months.

## Analysis of problem

The team analyzed the workflow using a fishbone diagram. The team addressed all final root causes which were actionable:

- 1) Congested with messages on cases
- 2) Messages are not arranged according to case priority
- 3) No indication on case status
- 4) Human error in entry of UVC cases



## Initiatives

### PDSA

- **Plan:** Using of a mobile and web-based application platform was proposed to facilitate the workflow of the UVC treatment activations inspired by Bed Management System.

Root Causes	Solutions
1) Congested with messages on cases	Visual management by displaying Priority 1 cases at the front of the other cases
2) Messages are not arranged according to case priority	
3) No indication on case status	Visual management by differentiation of tasks in waiting and tasks cleaning in progress
4) Human error in entry of UVC cases	Pop-up confirmation to allow user a second chance checking the location/task before proceeding

Fig 3: Root Causes and Solutions

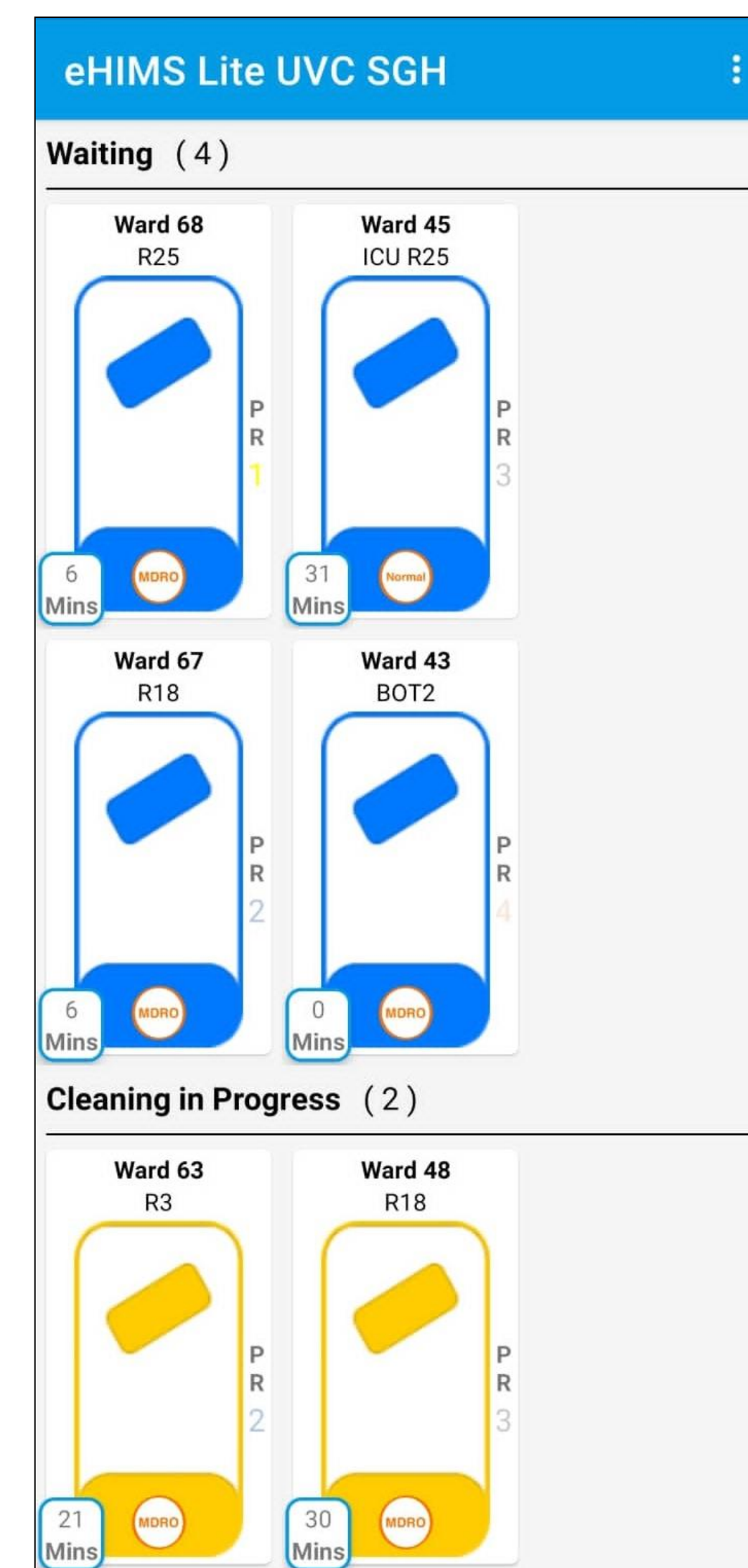


Fig 4: App Interface

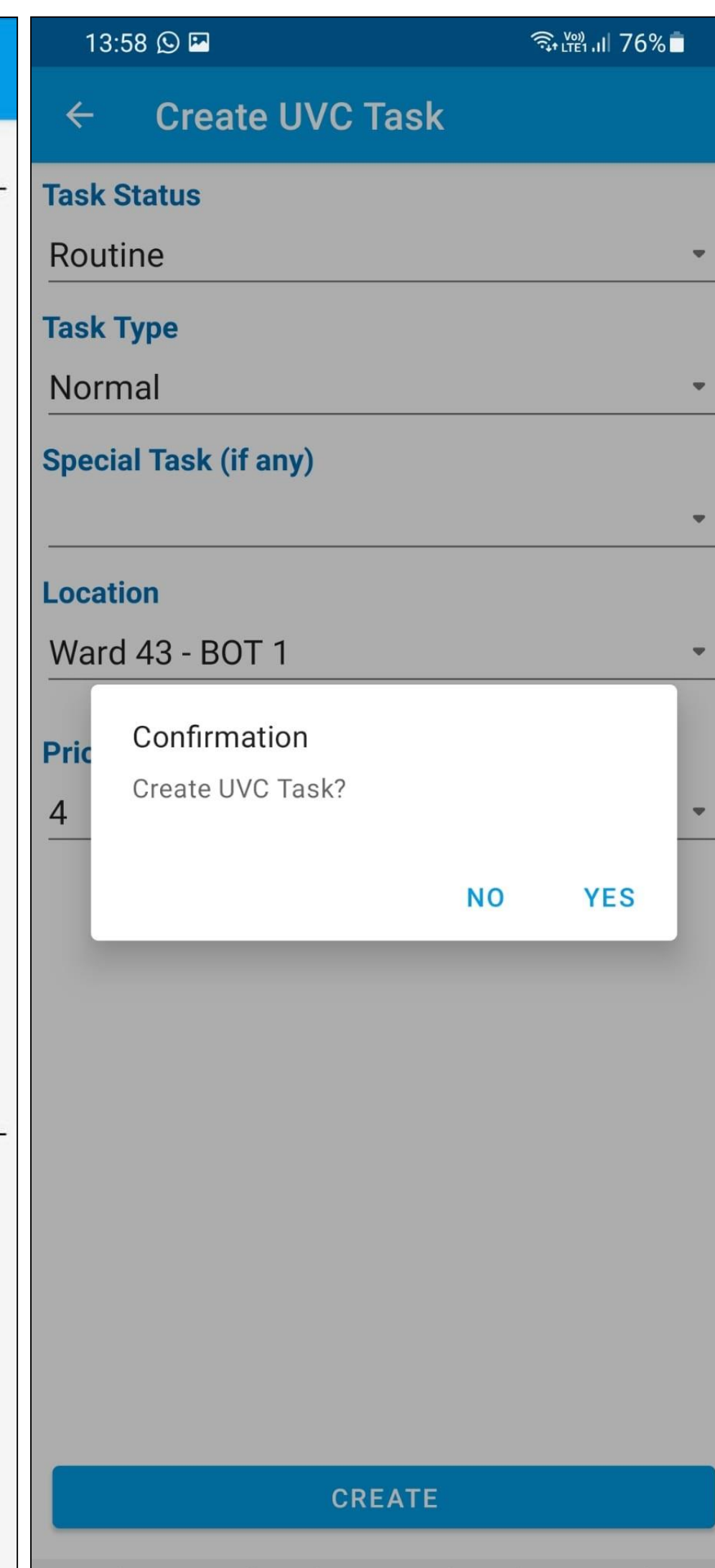


Fig 5: Pop-Up Box

- **Do:** Piloting of the system was carried out concurrently with existing workflow in Nov 2020 to ensure lead time for app testing and staff familiarity.

- **Study:** Supervisors and UVC operators were involved in system development stage to provide feedback to further streamline the work processes and improve the app interface. Monitoring of the data was in place during implementation stage to ensure the system captured data was authentic.

- **Act:** Full implementation of eHIMS Lite UVC mobile app started on Jan 2021.

## Results

The percentage of P1 cases activated between 8am to 5pm with response time >2 hours was analysed from August 2020 to June 2021. A shift in the run chart was observed. The pre-implementation median was **7.5%**. After we started PDSA1, the post-implementation median reduces to **2.8%**.

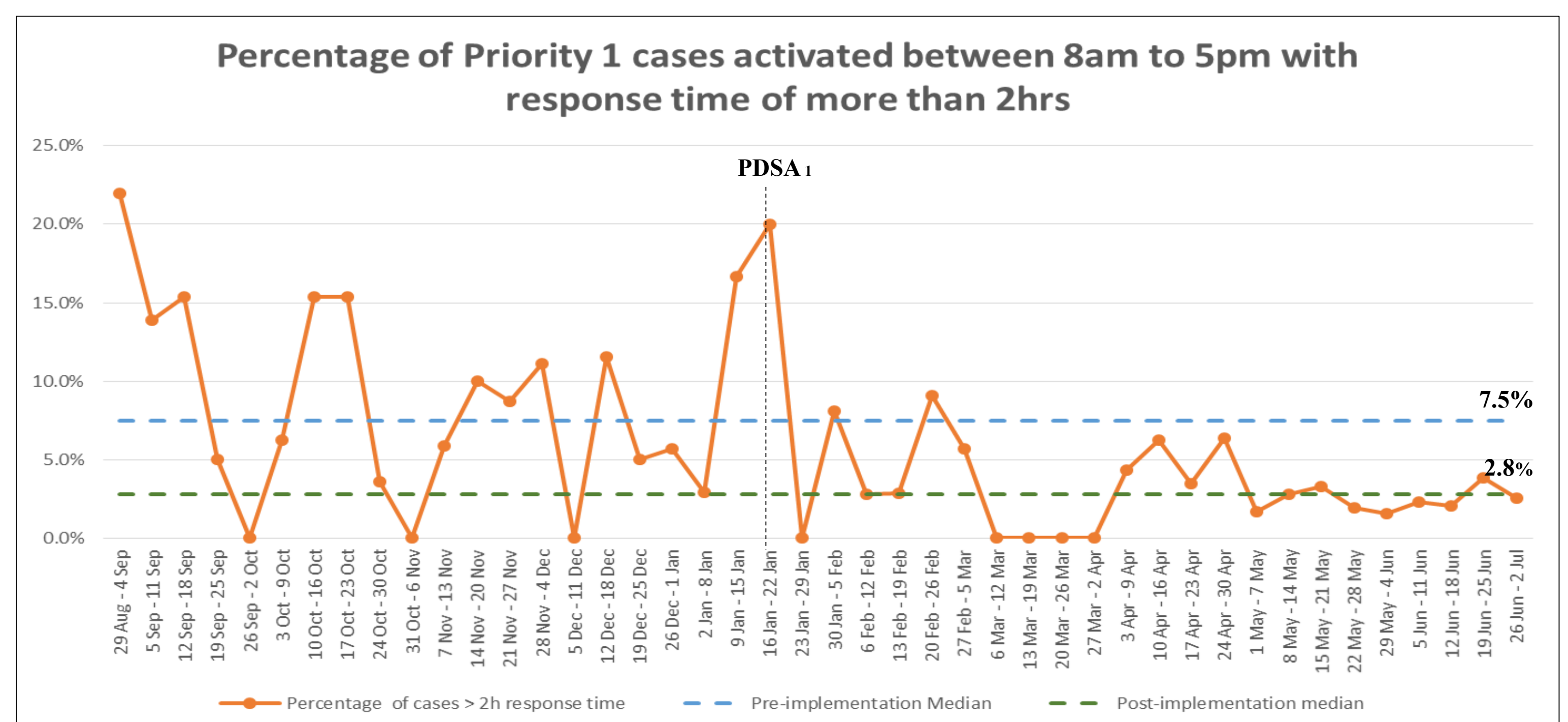


Fig 6: Run Chart

The maximum response time has also reduced greatly:

### Pre-Implementation (August 2020)

Maximum Response Time for P1 cases activated between 8am to 5pm: **18h 47m**

### Post-Implementation (June 2021)

Maximum Response Time for P1 cases activated between 8am to 5pm: **2h 13m**

## Sustainability Plans

The aim for the mobile application was to reduce response time and improve efficiency of the operations. Through the application, UVC operator were able to identify and attend to top priority cases therefore reducing the response time. The application also enhanced data collection, processing and analysis as compared with the former manual method.

The response time is also affected by other factors where some would need the assistance of several departments. Notwithstanding the external factors, the mobile application can be improved further to minimize human errors and for tracking of machine maintenance such as lamp hours. Data collected can be analysed on peak hours to better allocate manpower.