

## **Project Title**

To Reduce Time Taken in Submission of Carbapenemase producing Carbapenam Resistant Enterobacteriaceae (CP-CRE) Positive Laboratory Reports from Singapore General Hospital (SGH) to Ang Mo Kio Thye Hua Kwan Hospital (AMK THKH) by 90% in Three Months

## **Project Lead and Members**

- Senior staff nurse Wang Li, SGH
- Senior staff nurse Muhammad Razzan Bin Razaki, SGH
- Nurse Clinician Chew Sheh Li, SGH
- Ms Kheng Jia Hui, SGH
- ADN Ng Kim Choo Magdalene, SGH
- Mr David Yong Kok Leong, Ang Mo Kio Thye Hua Kwan Hospital

## **Organisation(s) Involved**

Singapore General Hospital (SGH), Ang Mo Kio Thye Hua Kwan Hospital (AMK-THKH)

## **Aims**

Our mission statement is “To reduce time taken in submission of CP-CRE positive laboratory reports from SGH to AMK-THKH from 19 hours to 1.9 hours (90%) in three months.”

## **Background**

See poster appended / below

## **Methods**

See poster appended / below

## **Results**

See poster appended / below

## **Conclusion**

See poster appended / below

## **Additional Information**

Singapore Healthcare Management (SHM) Conference 2021 – Merit Award  
(Operations Category)

## **Project Category**

Care & Process Redesign

## **Keywords**

Care & Process Redesign, Workflow Redesign, Process Improvement, Plan Do Study Act, Efficient Care, Time Saving, Cost Saving, Healthcare Administration, Singapore General Hospital, Ang Mo Kio Thye Hua Kwan Hospital, Operations, Carbapenemase Producing Carbapenam-resistant Enterobacteriaceae, Patient Navigator, IRMS System, Bed Days Saving, Community Hospital Referral Team

## **Name and Email of Project Contact Person(s)**

Name: Wang Li

Email: singaporehealthcaremanagement@singhealth.com.sg

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## Singapore Healthcare Management 2021

# To reduce time taken in submission of Carbapenemase-producing-carbapenam-resistant Enterobacteriaceae (CP-CRE) positive laboratory reports from SGH to Ang Mo Kio-Thye Hua Kwan Hospital (AMK-THKH) by 90% in three months.

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## Background

From January 2018 to December 2018, the Community Hospital/Hospice Referral team (CHRT) Patient Navigator (PN) has been doing daily tracking of Carbapenemase producing-carbapenam-resistant Enterobacteriaceae (CP-CRE) cases. Records showed 94.3% of patients with CP-CRE had been referred to Ang Mo Kio-Thye Hua Kwan Hospital (AMK-THKH) for step-down care for rehabilitation or subacute care (Figure 1). This was due to AMK-THKH being able to cohort CP-CRE cases, as well as they have sufficient isolation beds as compared to other community hospitals. The rest of the community hospitals would require a single isolation room for CP-CRE positive cases. Due to the limitations of the isolation beds and the need to isolate CP-CRE cases in a single room there were many rejected applications seen in the e-Integrated Referral Management System (IRMS) for other community hospitals. In addition, the number of patient tested for CP-CRE has become increasingly high due to SGH infection control preventive measure, as screening of CP-CRE is needed upon admission and subsequently every 14 days. AMK-THKH often feedback that they have difficulties in receiving CP-CRE positive reports of the patients, examples: has difficulties in getting through ward nurses through Phone calls, multiple reminders needed to get the CP-CRE report, thus leading to long processing time to receive the report. These have affected the efficiency in the seamless transfer workflow. After analyzing the data and workflow (Figure 2), the average time spent to provide the CP-CRE result to AMK-THKH Admission Office was 19 hours. The process involved many parties and steps thus resulting in delay for transfer. Hence, this project is selected to prevent unnecessary delays in providing AMK-THKH with the CP-CRE report to aim for a timely and seamless transfer.

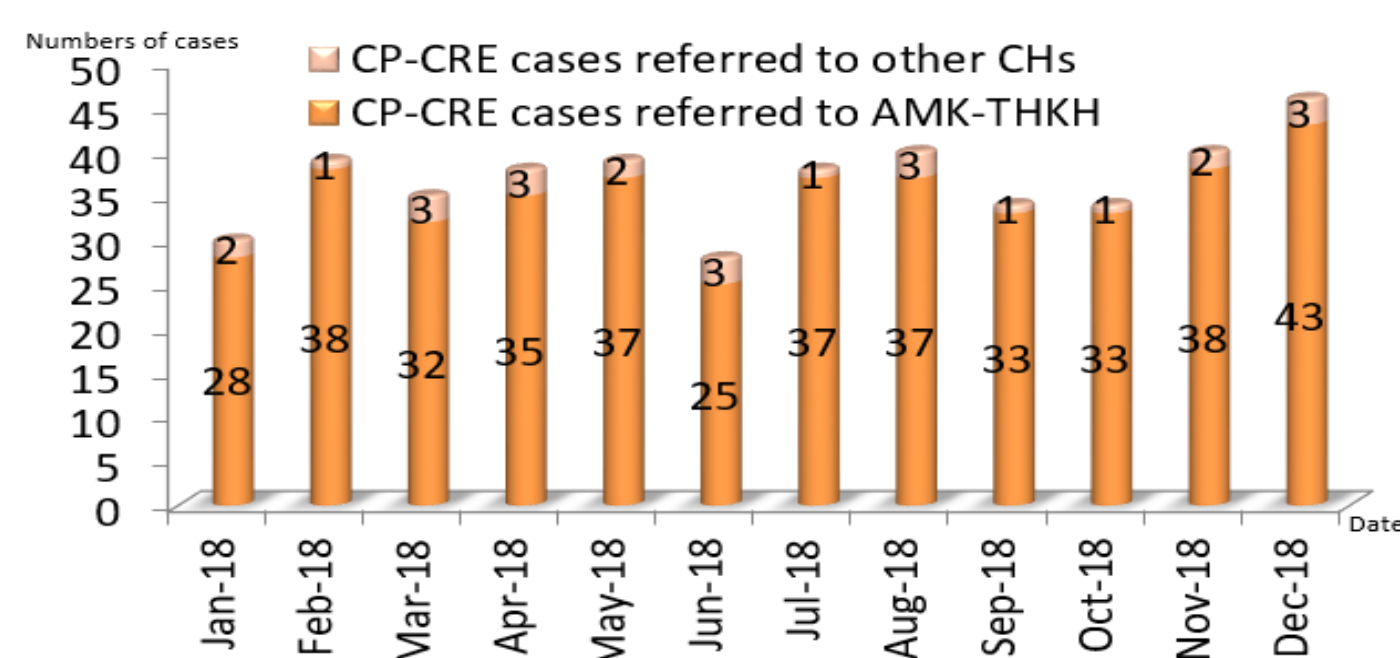


Figure 1: monthly cases were referred to AMKCH and other CHs in 2018.

2018 data: total CP-CRE cases : 441 cases  
 Total cases referred to AMK-THKH: 416 cases,  
 Total cases referred to other CH: 25  
 94.3% of the CP-CRE cases were referred to AMK-THKH in 2018

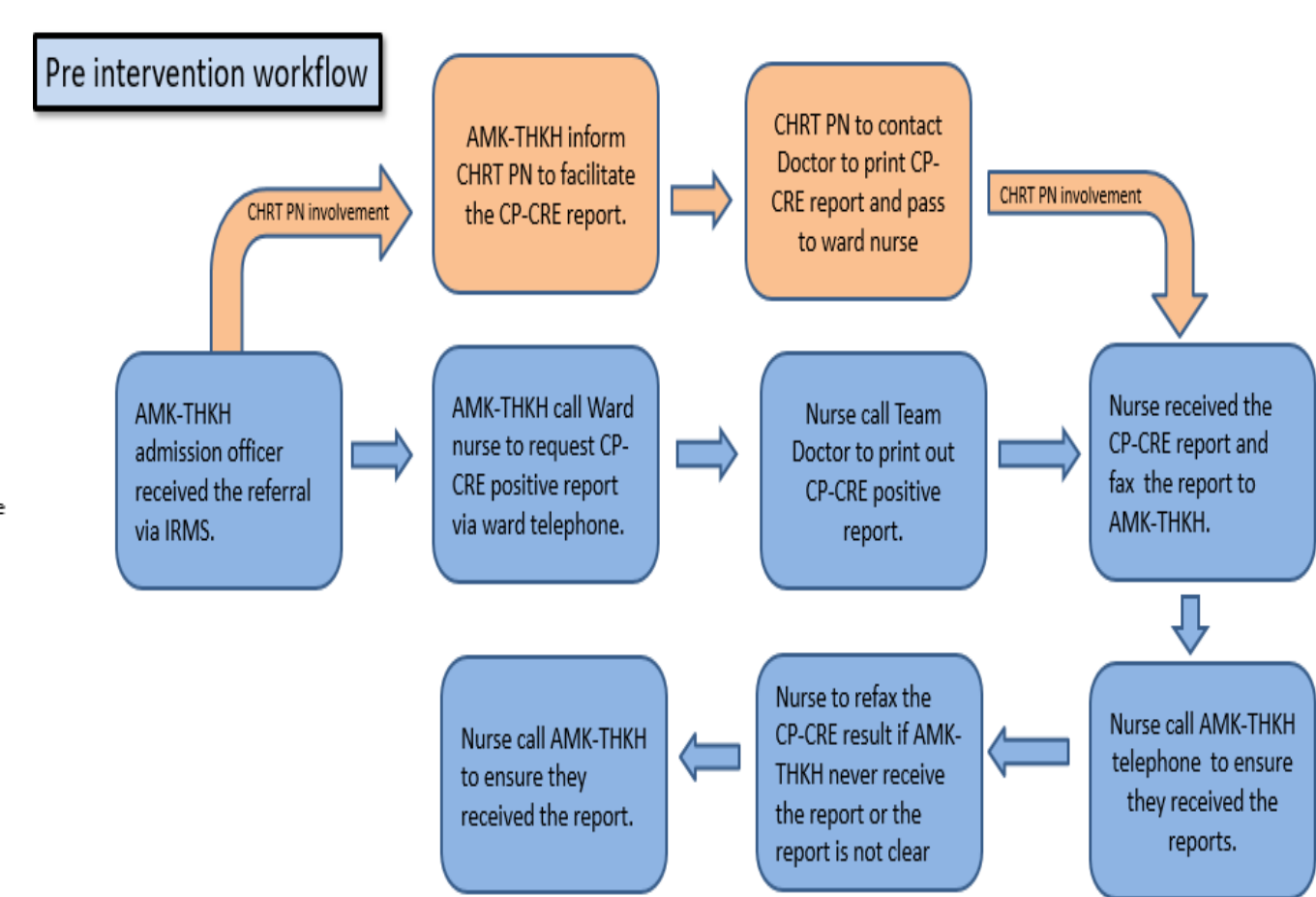


Figure 2: current workflow

## Mission Statement

Our mission statement is "To reduce time taken in submission of CP-CRE positive laboratory reports from SGH to AMK-THKH from 19 hours to 1.9 hours (90%) in three months."

## Analysis

With the feedback gathered, our team used the Cause and Effect Diagram (Figure 3) to identify the root causes of our problem.

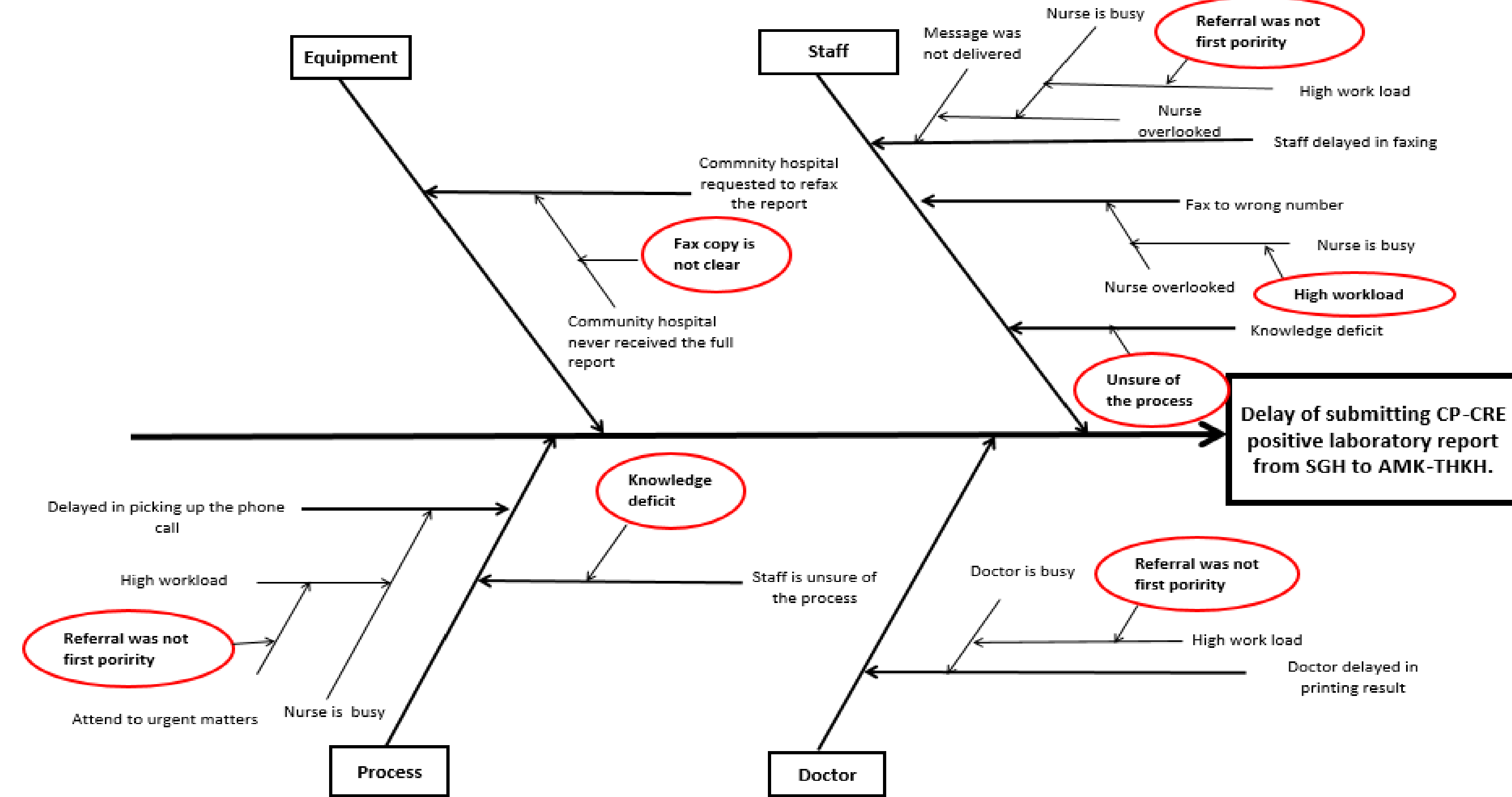


Figure 3: Cause and Effect Diagram

The Pareto Diagram was used to identify the final root causes in order to develop the corresponding interventions (Figure 4).

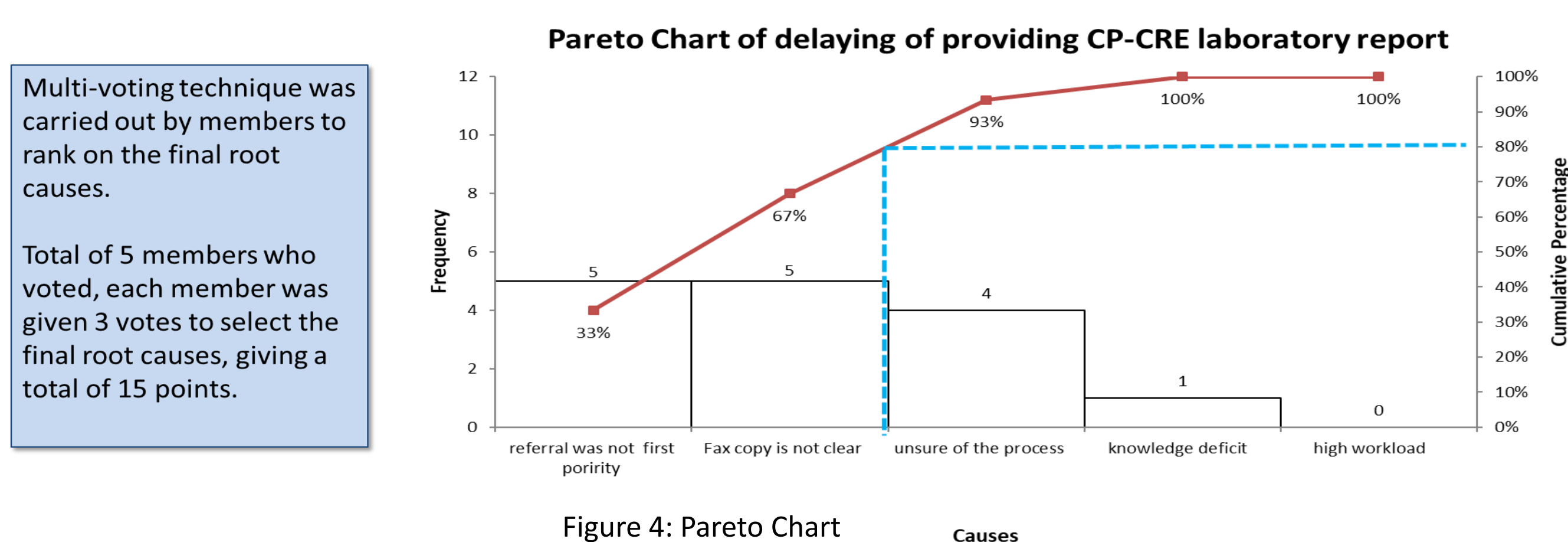


Figure 4: Pareto Chart

## Interventions

For the implementation, the team firstly revised the workflow via eliminating unnecessary steps ((Figure 5), which included identifying CHRT PN as point of contact, to eliminate the steps involving of ward doctors and nurses' printing and faxing. This intervention can largely shorten the referral processing time. Secondly using 2 interventions to streamline the improved workflow. 2 PDSA cycles were conducted after revised the workflow (Figure 6 and Figure 7). Feedbacks were gathered from various stakeholders to check for the feasibility of the proposed solutions.

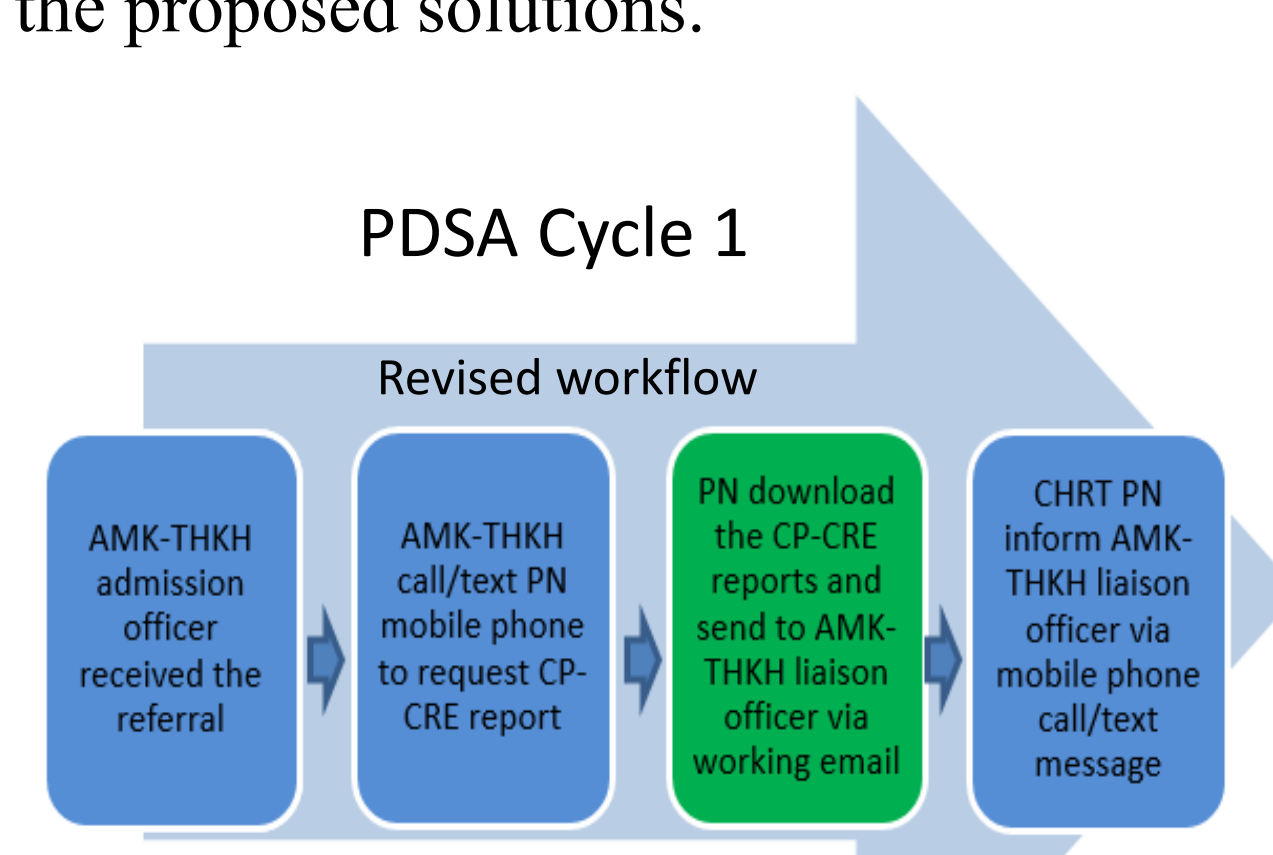


Figure 6

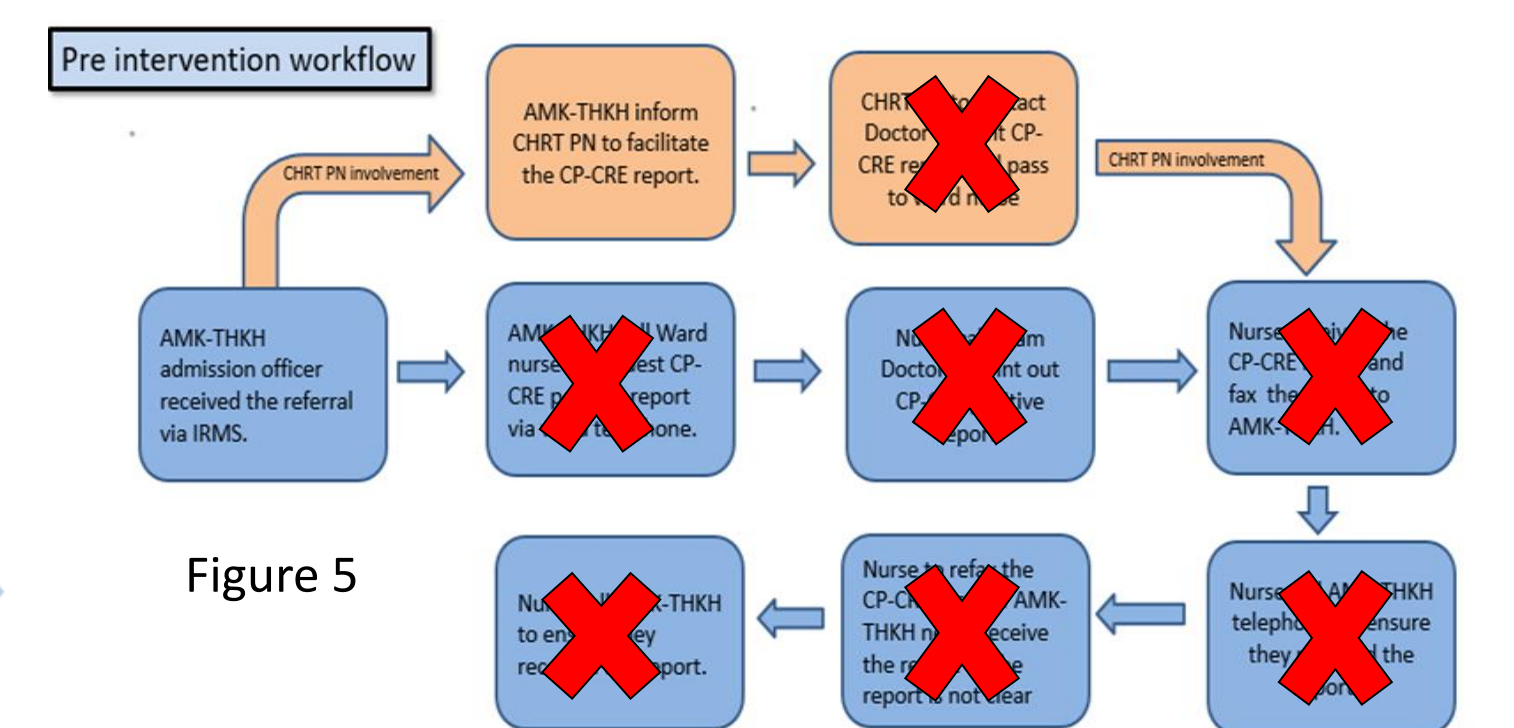


Figure 7

- Interventions**
1. Revised the workflow via eliminating the steps involving ward doctor and nurses, identify CHRT PN as point of contact.
  2. Provide PN mobile phone number to AMK-THKH, and get mobile phone contacts from AMK-THKH for easy and fast communication.
  3. PN direct download the Lab report and send to AMK-THKH via working email attachment. Eliminate the involvement of hard copy printing and faxing.

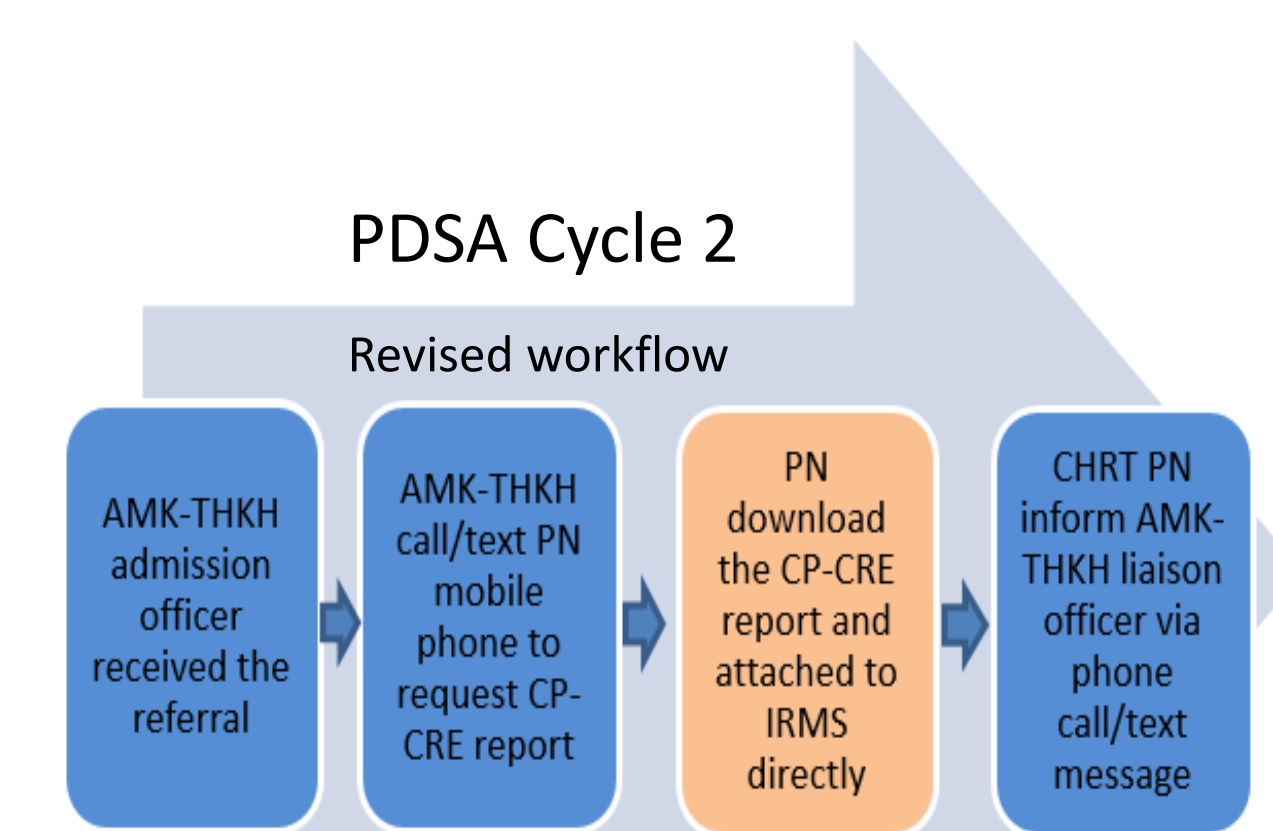
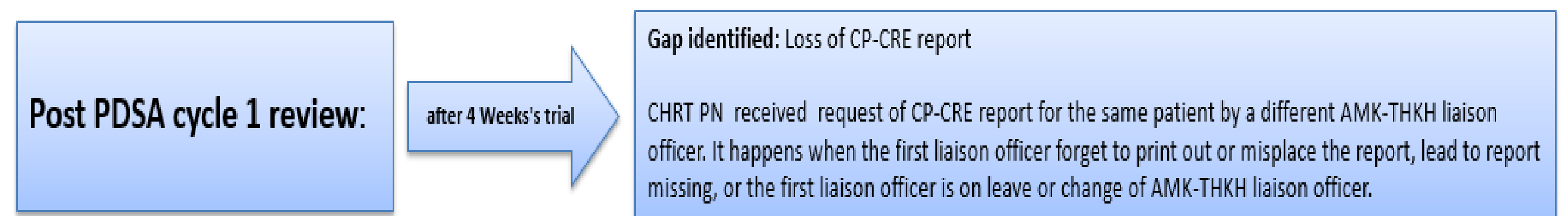


Figure 7

- Post PDSA cycle 2 review (12 weeks trial)**
- Enhancement:**  
 PN direct download the report and attach the report via IRMS attachment.
- Advantages of the Final intervention:**
- 1) **Time saving.** Eliminate the multiples staff involvement, cut the unnecessary steps.
  - 2) **Easy to implement.** The new member can follow up the workflow easily.
  - 3) **Cost saving.** save manpower and paper.
  - 4) **Better communication** via shared platform (IRMS)
  - 5) **Easily reachable.** CHRT PN as point of contact, using mobile phone instead of ward telephone.
  - 6) **Utilize the existing resources.** example: IRMS system and staff (PN)
  - 7) **Permanent reference:** the result can be permanently attached in IRMS.

## Results

The average time spent from 19 hours was reduced to 0.125 hours (Figure 8), saved 18.875hour per case, this was translated to 99.3% time saved. These interventions were also measured through hospital bed days saving, manpower saving and staff satisfaction survey. This project also created a better workflow for Patient Navigators in a systematic way to provide the relevant documents to the Community Hospital. It is also in tandem with the SGH's priorities statement- patient centric care in providing seamless transfer in patient care delivery.

The similar workflow has already been replicated to all the Community Hospitals' referrals and other relevant documents, the result has been tested to be feasible and efficient.

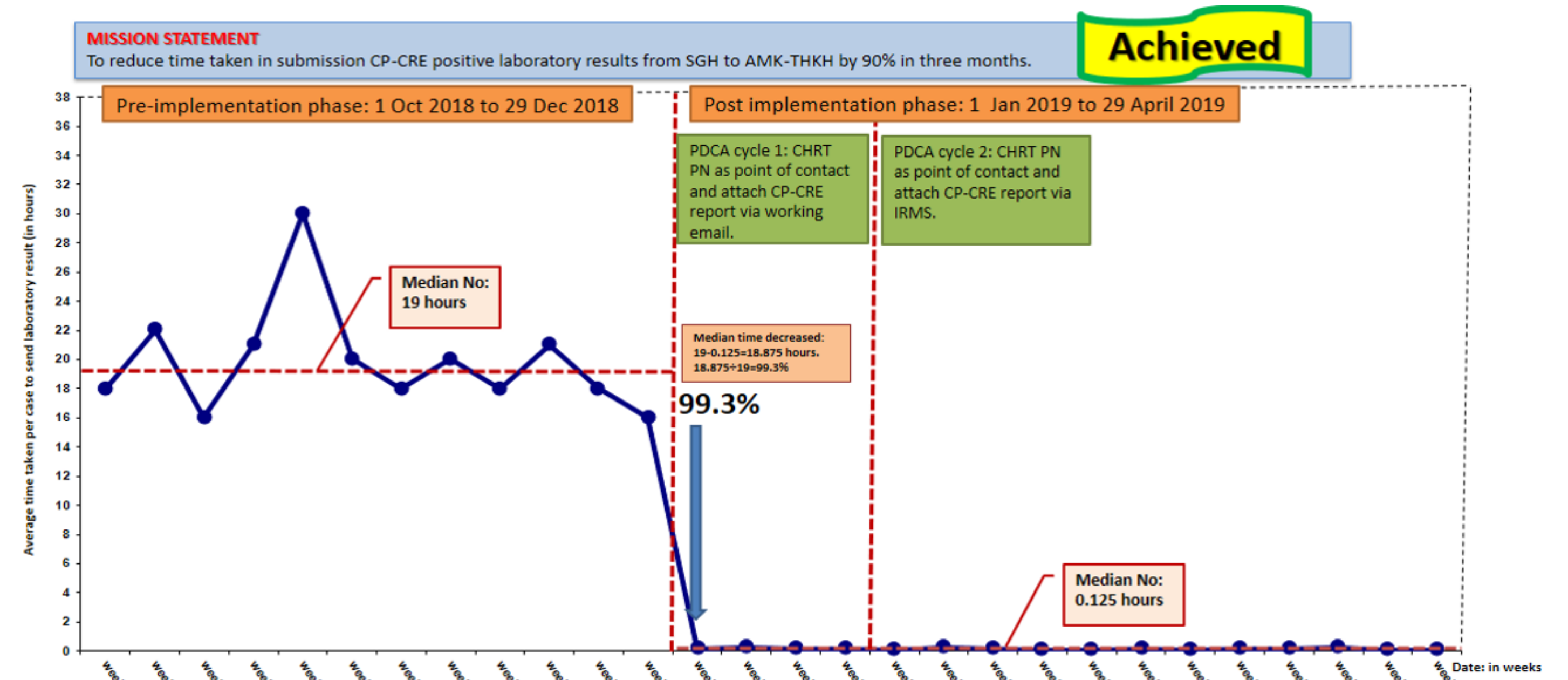


Figure 8 Run chart

**Estimated bed days Saving:** 18.875hrs x416 cases/year ÷ 24hrs/day=327.2 bed days per year.  
 (Cost saving calculated based on total 416 cases in 2018)

## Sustainability Plans

The project has established new workflow via IRMS system. The PN taking charge of CHRT is following the recommended way to process the referral. The project has suggested the improved workflow is sustainable, and it has helped in time saving and able to work within the constraints of manpower to meet the rising demands of e-Integrated Referral Management System (IRMS) Community Hospital referrals