



CK BIRLA
HOSPITAL®

KEY
PERFORMANCE
INDICATOR
(KPI) ANALYSIS
(GURGAON UNIT)

Submitted by-
Dr. Ritika Bhattacharya
BDS,MBA
Medical services intern

INTRODUCTION

A hospital **Key performance indicator (KPI)** is a quantifiable measure that monitors the quality and safety of care of healthcare provided by the hospital and measures the overall success of the business. A Key Performance Indicator (KPI) differs from an audit as the KPI is an indicator of areas that require further follow up and investigation, where an audit is an assessment of performance against a set of standards or criteria in a health or social care service.

Aim of the Project

Developing and optimizing
a robust key performance
evaluation system for
clinical departments in a
multi-specialty hospital:
An analytical study



Table of Content

S.No	Header	Page
1	<u>Literature Review</u>	5
2	<u>Methodology</u>	6
3	<u>Sample Size calculation</u>	7
4	<u>Data Analysis and findings (executive summary)</u>	8
5	<u>Annexure 1</u>	11
6	<u>Detailed analysis of indicators across departments</u>	12
7	<u>Recommendations & Conclusion</u>	26

Literature Review

- The **Research grant council of Hong Kong** by the scientists Wenque Liu, Albert and Man Chan, Amor Darco in the year 2024 states that the successful implementation of Key performance indicators tends to confront sundry challenges in different phases due to their complexity and particularity. Employing key performance indicators (KPIs) facilitates the **monitoring of Hospital performance** to advance the successful care delivery.

<https://www.emerald.com/insight/content/doi/10.1108/ECAM-10-2023-1060/full/html>

- According to an article published in **Journal of Eastern Europe** in business and economics by Barliba Loan, Andrei Stefan nestian and Silviu Tita in the year 2012 a research conducted at a Romanian public health system confirms that the hospitals performance management model presents a series of advantages compared to the other models currently used in Romania. Its main advantage compared to these is the fact that the management decisions and actions at a strategic and tactical level are connected to the system of performance planning. Monitoring Key performance indicators also allows certain interpretations to be obtained regarding performance at medical level as well as at administrative and economic levels.

<https://ibimapublishing.com/articles/JEERBE/2012/674169/674169.pdf>

- A chapter in **Boundaryless Hospitals** (Book on rethinking and redefining Healthcare management) written by Paul gemmel in the year 2018 shows several research based references states that the development of process-oriented performance measurement systems is crucial. Most performance measures in hospitals are not process-oriented at the moment and cannot help a health care system to better synchronize the patient, material and information flows. The Development of an Operational Dashboard helps to Coordinate and Optimize Patient, Material and Information

Flows. https://link.springer.com/chapter/10.1007/978-3-662-49012-9_9

Methodology

- The study utilizes a mixed method approach- combining **qualitative data collection** through stakeholder interviews and health information system with **quantitative analysis** of all the **33** 5th edition NABH key performance indicators for the duration of **6 months**.

- The methodology also involves

A) **Data validation**

B) **Reliability testing**

C) **Statistical analysis** to ensure the robustness of the evaluation system

The objectives of the study are-

1) **Collation** of medical service indicators across a unit of a multi-speciality hospital chain to form a repository

2) **Grouping** indicators in various **baskets** to serve as a database for comprehensive **dashboards** for managerial review

3) **Review** data sanctity ,validate methodology ,database and sample size and suggest corrective actions

4) **Implementation** of actions to reduce the gaps in the non-conformance indicators and make **recommendations** for various stakeholders

Sample Size Calculation

Since a Dashboard for KPIs has not been implemented until the start of this project, a sample size for analyzing an indicator was also not determined.

- 1) **100%** Sample size has been taken for the analysis of **27 indicators** out of the total indicators that are analyzed.
- 2) **6%** sample size for **Time for Initial assessment of patients** in the wards has been taken due to time and shortage of data availability.
- 3) **30%** sample size of **waiting time for diagnostics** and **error prone abbreviations** has been taken as per NABH 5th edition guidelines due to very high sample.

Data Analysis & Findings

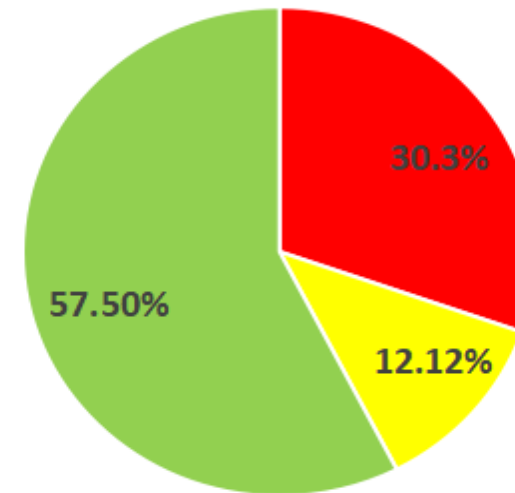
Executive Summary

A summary of all the NABH 5th edition key performance indicator's risks identified according to performance standards, along with their categorization is as follows :

#	Department	High risk 	Medium risk 	Low risk 	Total
1	Emergency	1	0	0	1
2	OPD	1	0	0	1
3	Infection Control	0	0	7	7
4	Diagnostics	0	1	2	3
5	IPD	2	0	2	4
6	ICU	2	0	0	2
7	ICU, IPD	0	0	1	1
8	OT	1	0	3	4
9	Pharmacy	1	0	1	2
10	Others	2	1	3	6
11	Blood and blood components	0	2	0	2
	Total	10	4	19	33

KPI Analysis (Risk assesment)

■ High risk ■ Medium risk ■ Low risk



CRITERIA :

4 or above months crossing benchmark (Bad performance)	High risk 
3 months crossing benchmark (Average performance)	Medium risk 
Less than 3 months crossing benchmark (Good performance)	Low risk 

Data Analysis & Findings

Executive Summary

A summary of all the NABH 5th edition key performance indicator's implementation identified according to performance standards, along with their categorization is as follows :

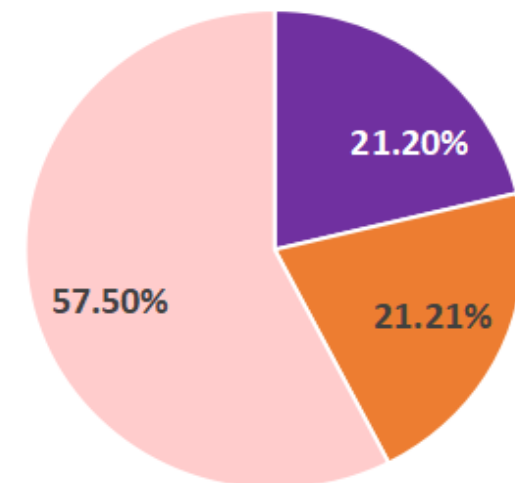
#	Department	Not implemented 	Incorrectly implemented 	Implemented 	Total
1	Emergency	0	0	1	1
2	OPD	0	1	0	1
3	Infection Control	0	0	7	7
4	Diagnostics	1	0	2	3
5	IPD	3	0	1	4
6	ICU	1	0	1	2
7	ICU, IPD	0	0	1	1
8	OT	0	1	3	4
9	Pharmacy	0	2	0	2
10	Others	1	3	2	6
11	Blood and blood components	1	0	1	2
	Total	7	7	19	33

CRITERIA :

Implemented	
Incorrectly implemented	
Not implemented	

KPI Analysis (Implementation status)

 Not implemented  Incorrectly implemented  Implemented



Data Analysis & Findings

Executive Summary

Root Cause Analysis of the indicators :

1. **Design Gap – Lack of SOP** has been noted in the following areas
 - Indicator of standardised Mortality Ratio for ICU.
 - Time taken for initial assessment of indoor patients
 - Indicators related to mock drills, near misses and patient handover during shift change (doctors)
 - Percentage of medication charts with error-prone abbreviations.
 - Percentage of cases who received appropriate prophylactic antibiotics within the specified timeframe.
2. **Gaps in IT implementation** have been noted in
 - Compliance rate to Medication Prescription in capitals (Pharmacy)
 - Time taken for initial assessment of indoor patients
 - Percentage of medication charts with error-prone abbreviations

It is to be noted that the above IPD and Pharmacy related indicators are high risk due to HIS inefficiency.
3. **Staff related challenges** has been observed in 9 indicators out of which 6 are high risk category-
 - A. **Undertrained staff** has been noted in 5 indicators.
 - B. **Both** Undertrained staff & Understaffing have been noted in 4 indicators

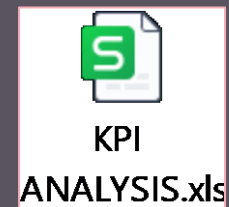
(Please refer Annexure 1 for details of staff related challenges for A,B & C above)
4. Indicator of Time taken for initial assessment of indoor patients suffers from all 3 root causes.

Annexure 1 – Summary of Staff challenges across indicators

S. No	Name of the Indicator	Risk Rating	Staff Challenge
1	Time taken for initial assessment of indoor patients	High	Undertrained
2	Percentage of medication charts with error-prone abbreviations	High	Undertrained
3	Return to the emergency department within 72 hours with similar presenting complaints	High	Understaffed, Undertrained
4	Percentage of cases who received appropriate prophylactic antibiotics within the specified timeframe	Low	Undertrained
6	Waiting time for out- patient consultation	High	Understaffed, Undertrained
7	Waiting time for diagnostics	Low	Undertrained
8	Time taken for discharge	High	Understaffed, Undertrained
9	Number of variations observed in mock drills	Medium	Undertrained
10	Compliance rate to Medication Prescription in capitals	High	Understaffed, Undertrained

ANALYSIS OF INDICATORS ACROSS DEPARTMENTS

Please refer to the following document for detailed analysis -



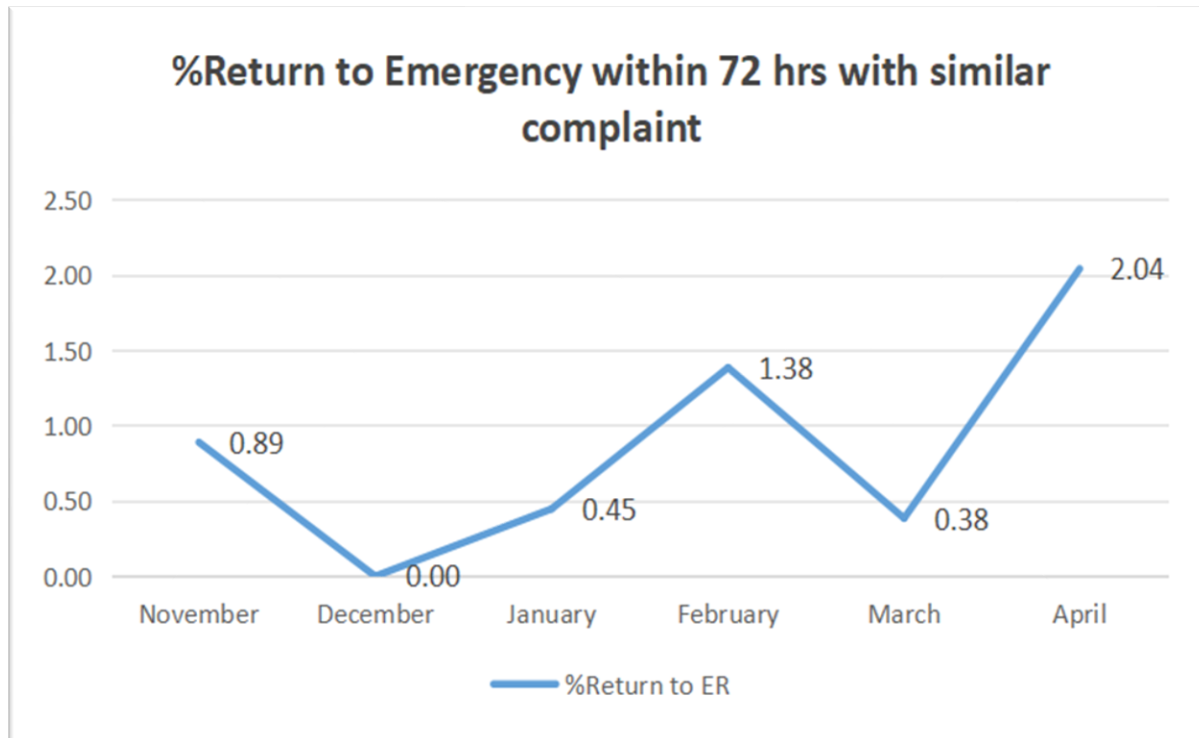
1. Emergency & OPD

1. Return to emergency within 72 hours
2. Waiting time for out-patient consultation

High risk	Implemented	Implemented
Medium risk	Incorrectly implemented	Incorrectly implemented
Low risk	Not implemented	Not implemented

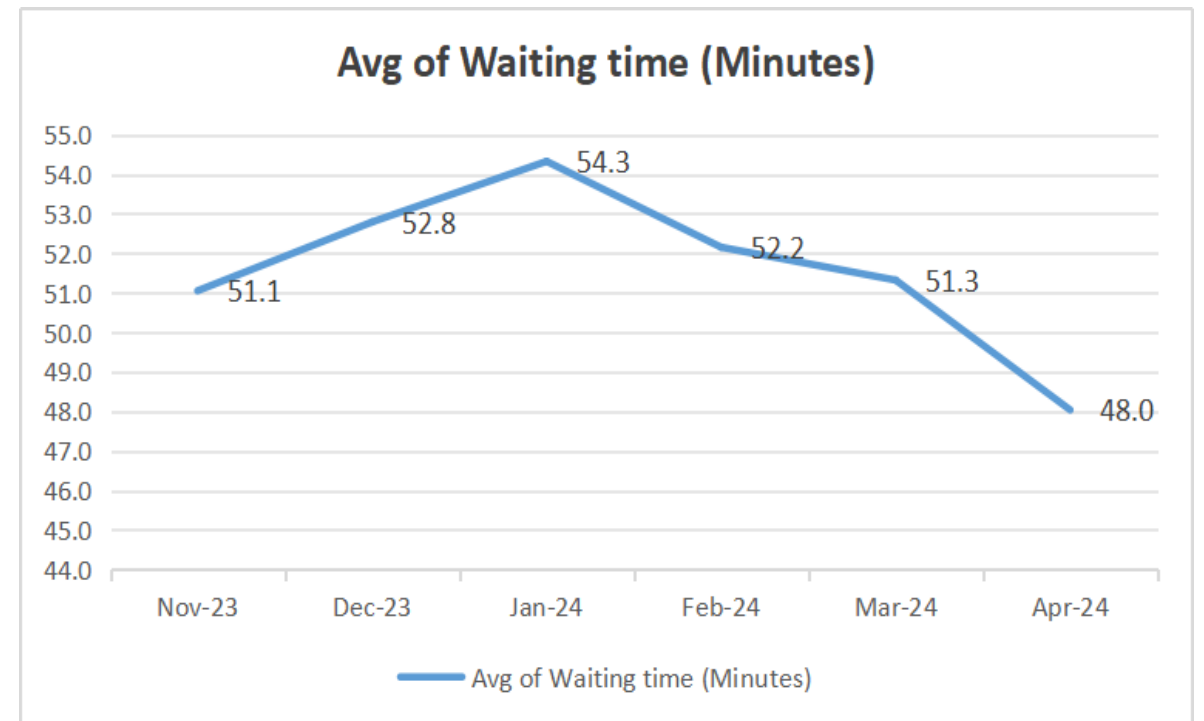
Emergency

Benchmark : <5 %



OPD

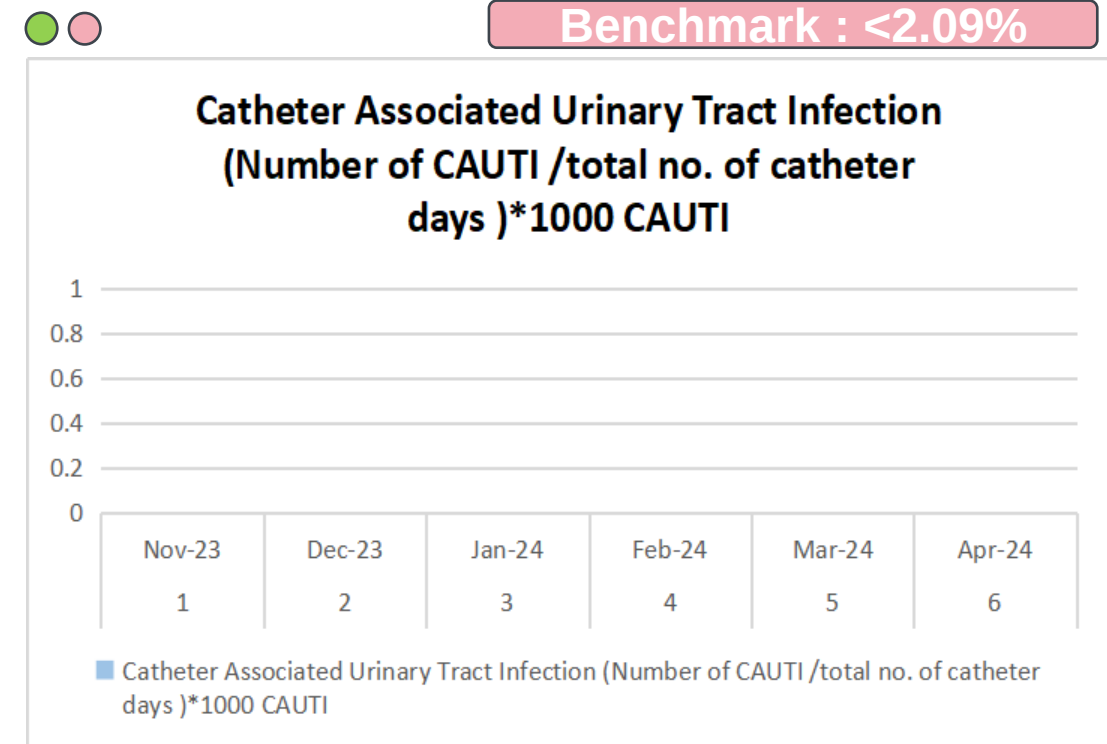
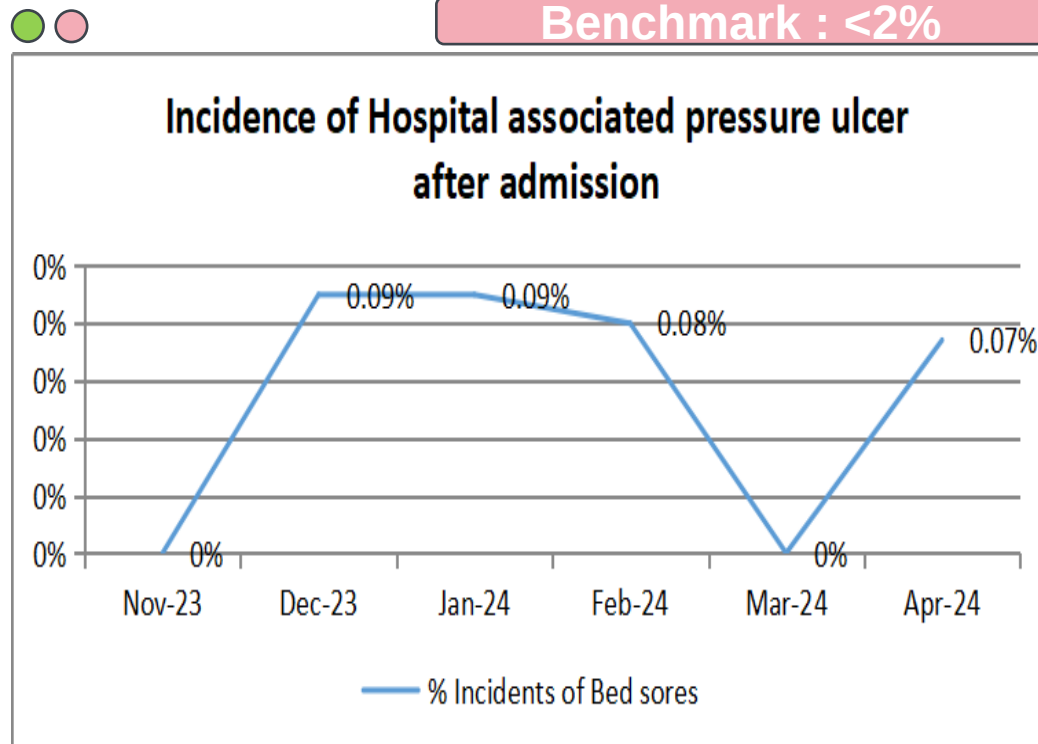
Benchmark : <30min



Infection Control

1. Incidence of Hospital Associated Pressure ulcer after admission
2. Catheter Associated Urinary Tract Infection rate
3. Ventilator Associated Pneumonia rate
4. Central line associated blood stream infection rate
5. Surgical site infection rate
6. Hand hygiene compliance rate
7. Incidence of Needle stick injuries

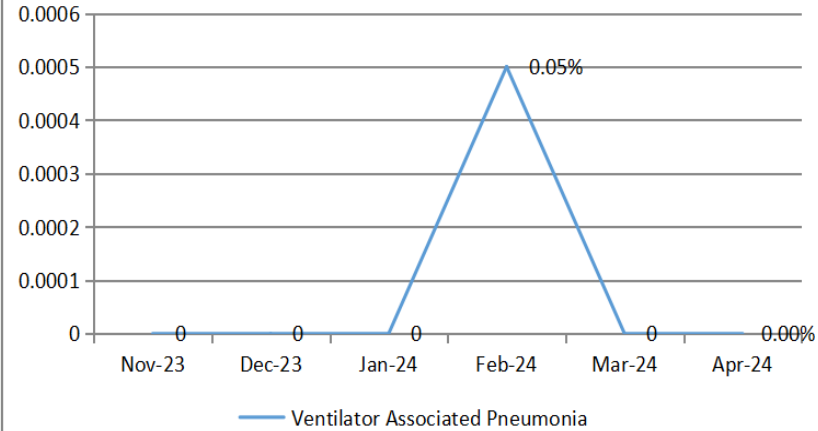
High risk	Implemented	
Medium risk	Incorrectly implemented	
Low risk	Not implemented	



High risk	Implemented	Implemented
Medium risk	Incorrectly implemented	Incorrectly implemented
Low risk	Not implemented	Not implemented

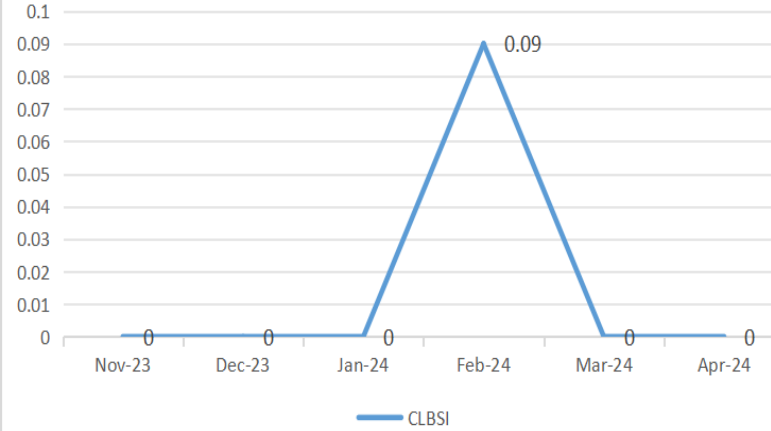
Benchmark : <1.4%

Ventilator Associated Pneumonia rate



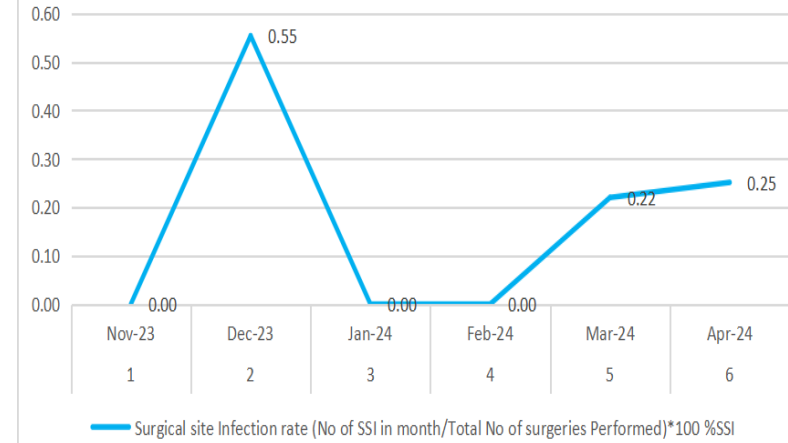
Benchmark : <1.02%

Cental line associated blood stream infection rate



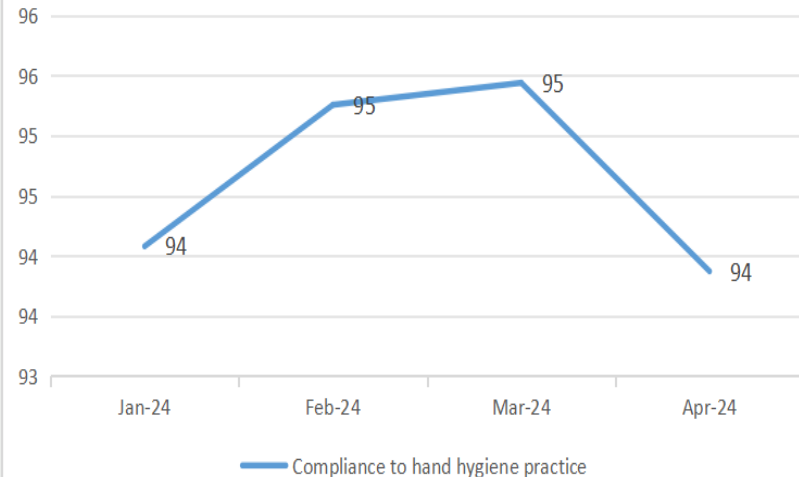
Benchmark : <2.5%

Surgical site Infection rate



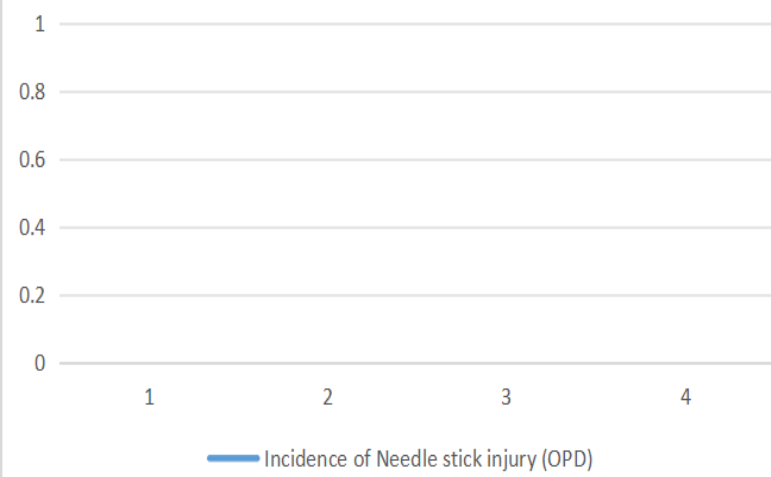
Benchmark : >70%

Compliance to hand hygiene practice (overall)

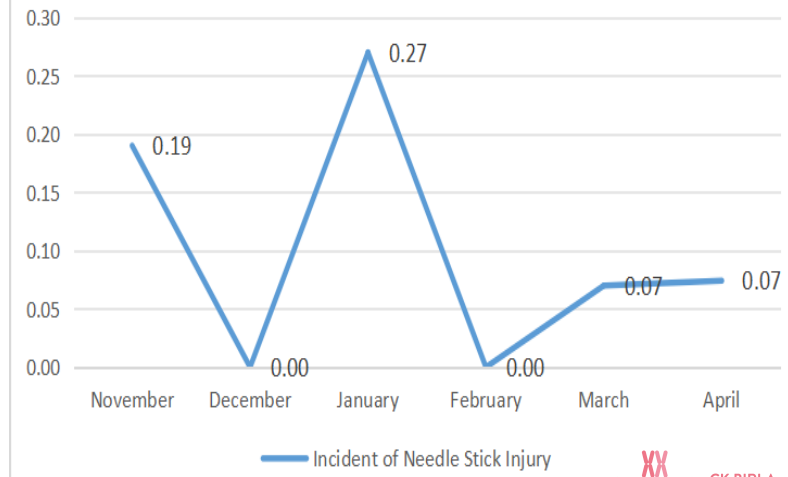


Benchmark : <2%

Incidence of Needle stick injury (OPD)



Incident of Needle Stick Injury (IPD)



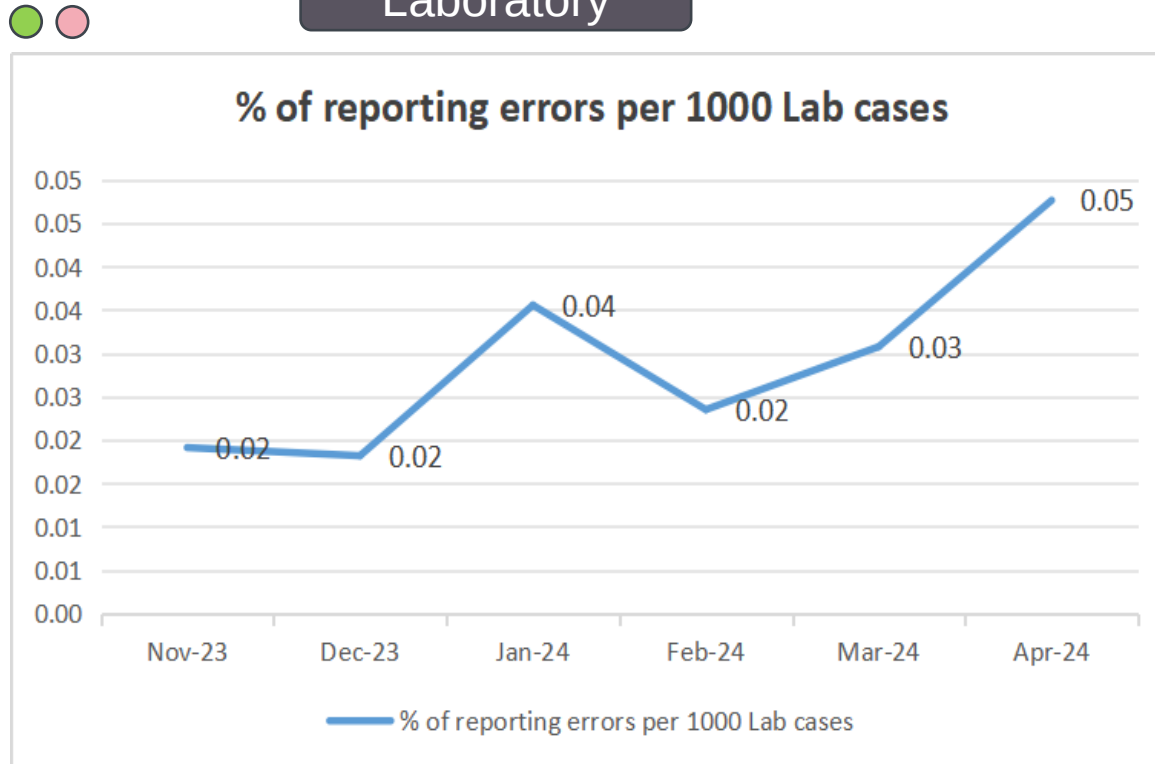
1. Diagnostics (Laboratory & Radiology)

1. No.of reporting errors per thousand investigations
2. Percentage of adherence to safety precautions
3. Waiting time for diagnostics

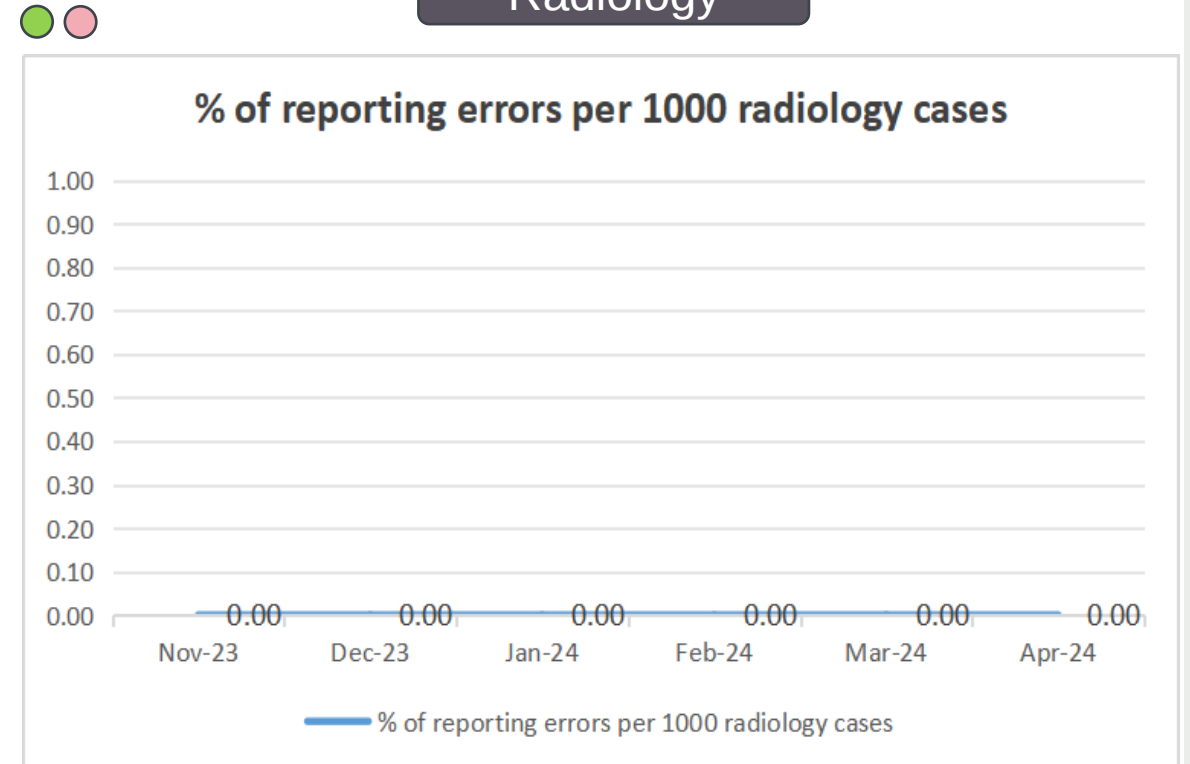
High risk	Implemented	Implemented
Medium risk	Incorrectly implemented	Incorrectly implemented
Low risk	Not implemented	Not implemented

Benchmark : 0.05

Laboratory

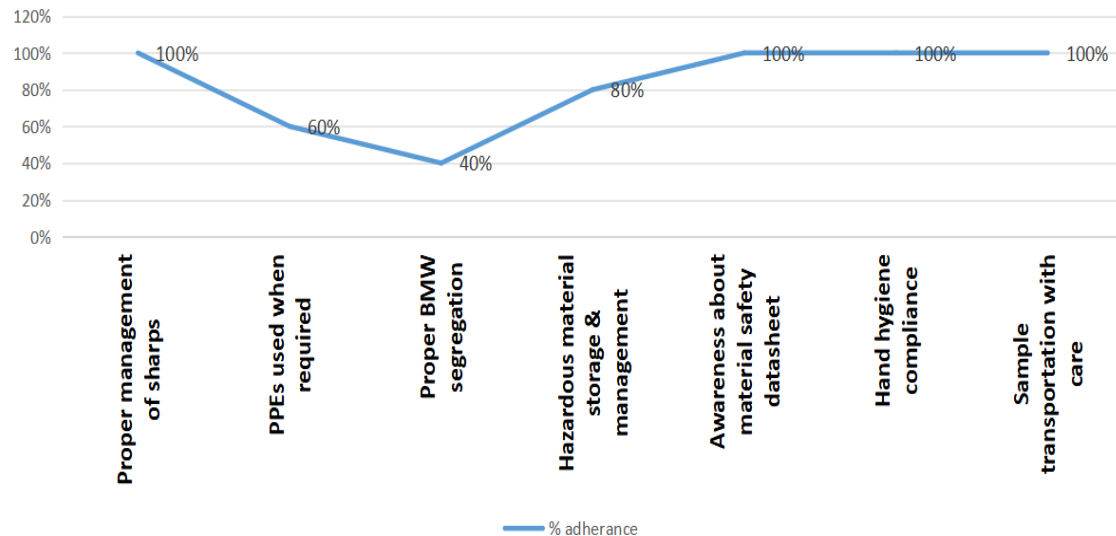


Radiology

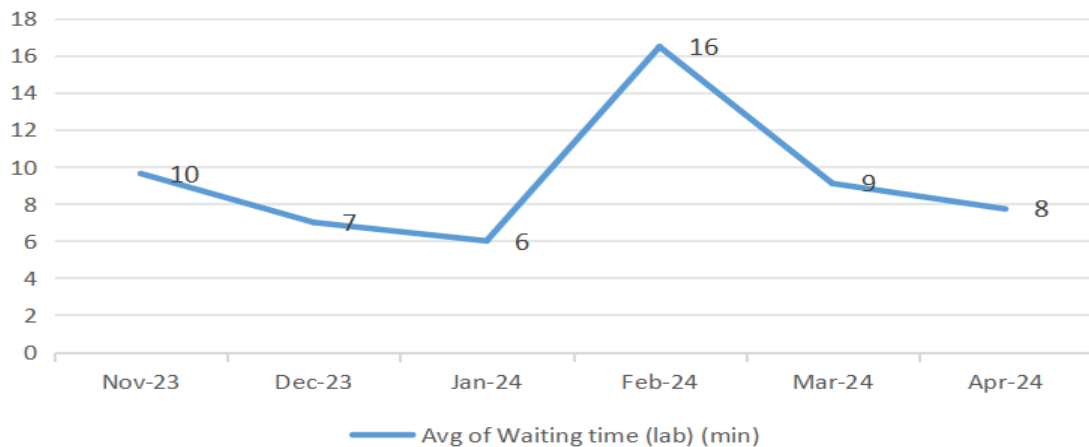


Laboratory

% adherence to the safety precautions



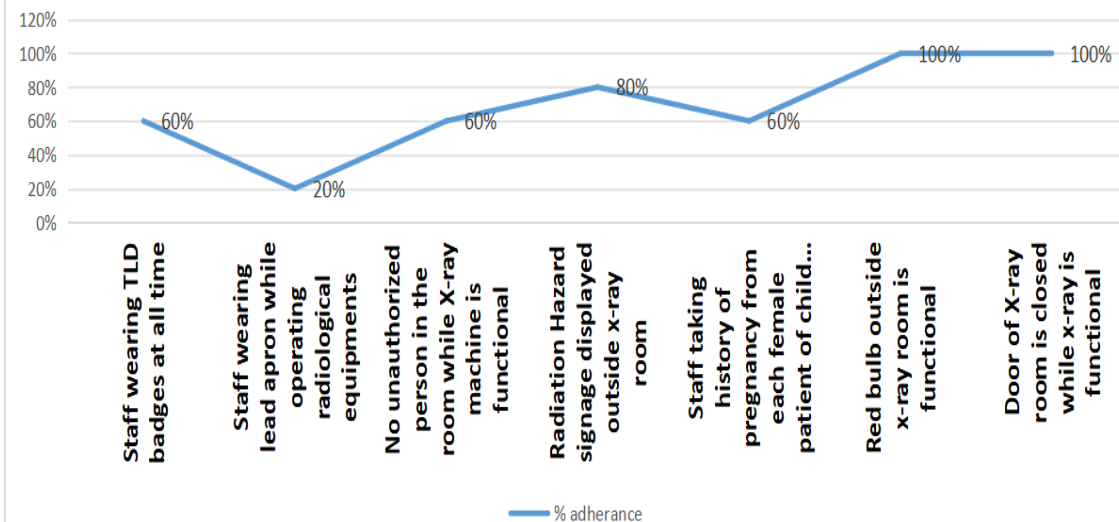
Avg of Waiting time (lab) (min)



Radiology

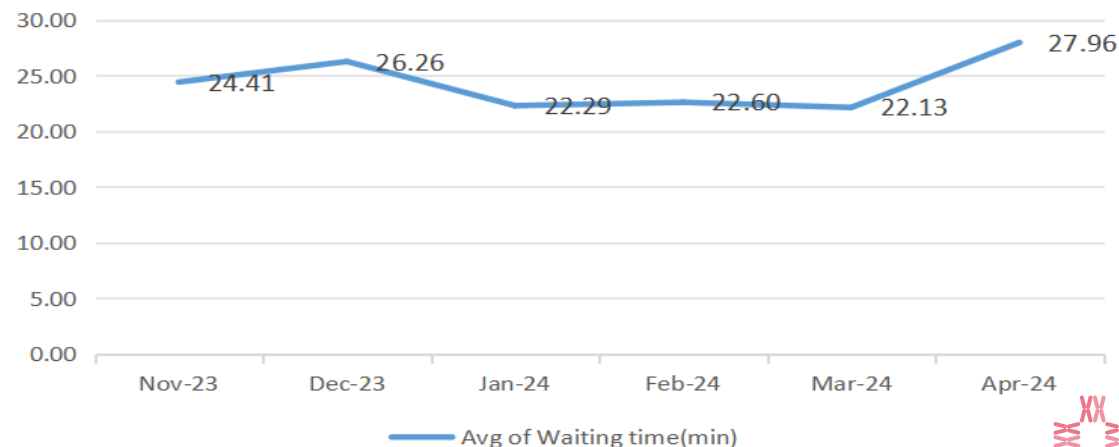
Benchmark : 100 %

% adherence to the safety precautions



Benchmark : <30min

Avg of Waiting time (radiology) (min)



IPD

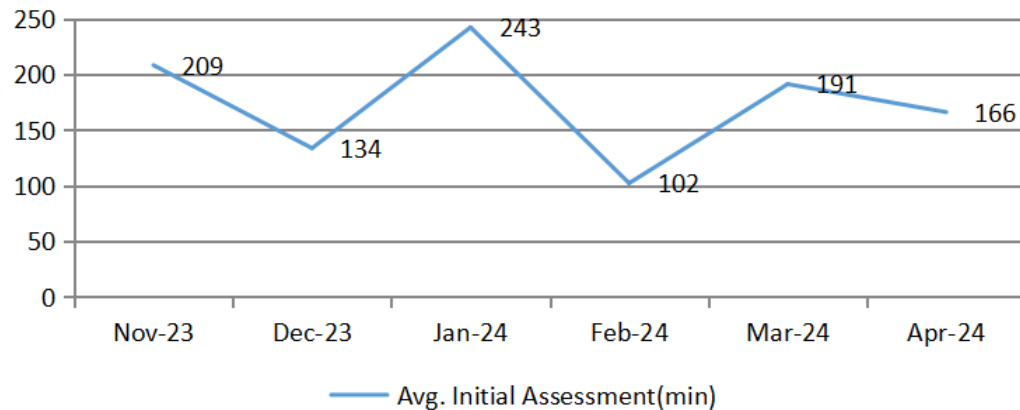
1. Time taken for initial assessment of indoor patients
2. Percentage of medication charts with error prone abbreviations
3. Percentage of in-patients developing adverse drug reactions
4. Percentage of medications having incomplete or improper consent
5. Nurse-patient ratio for ICU & Wards

High risk	Implemented	Implemented
Medium risk	Incorrectly implemented	Incorrectly implemented
Low risk	Not implemented	Not implemented



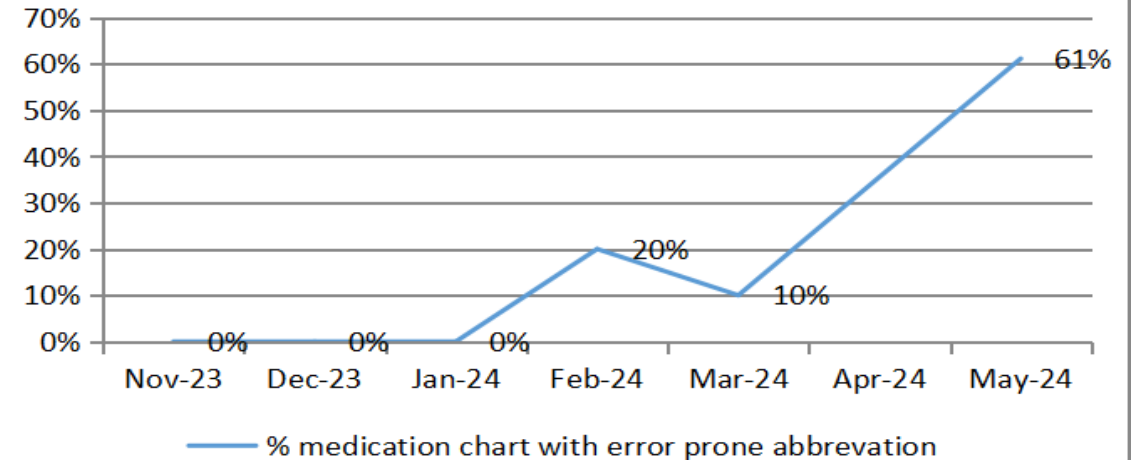
Benchmark : <60 min

Time taken for Initial Assessment of indoor patients (in min)

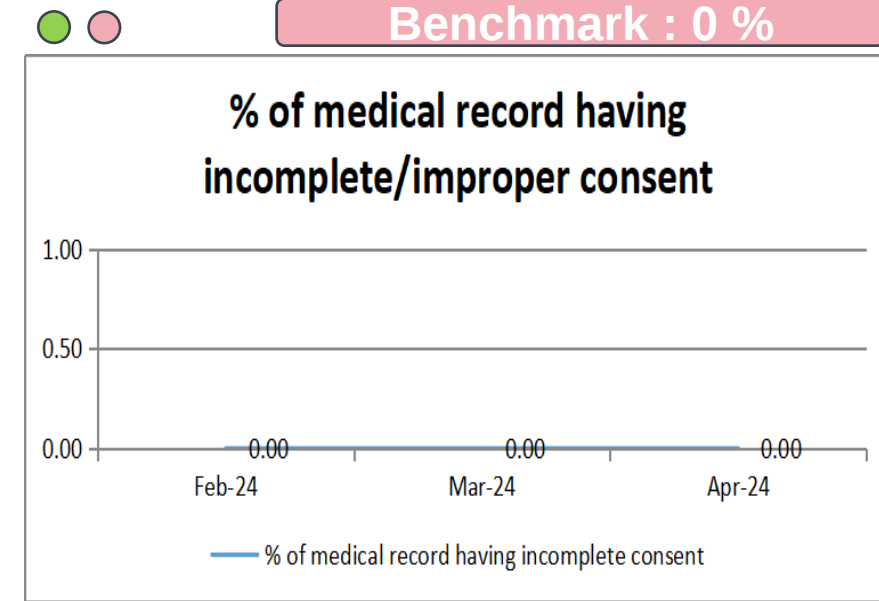
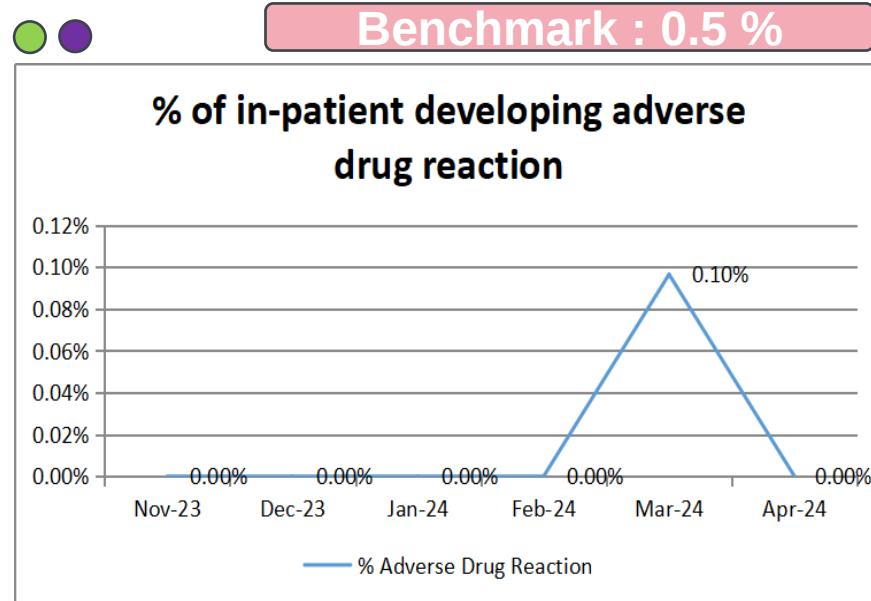


Benchmark : <1%

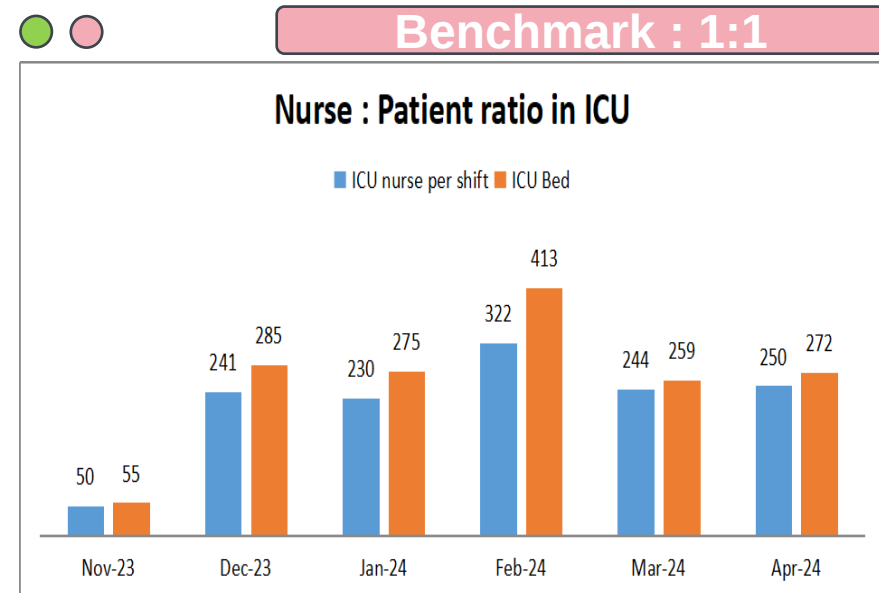
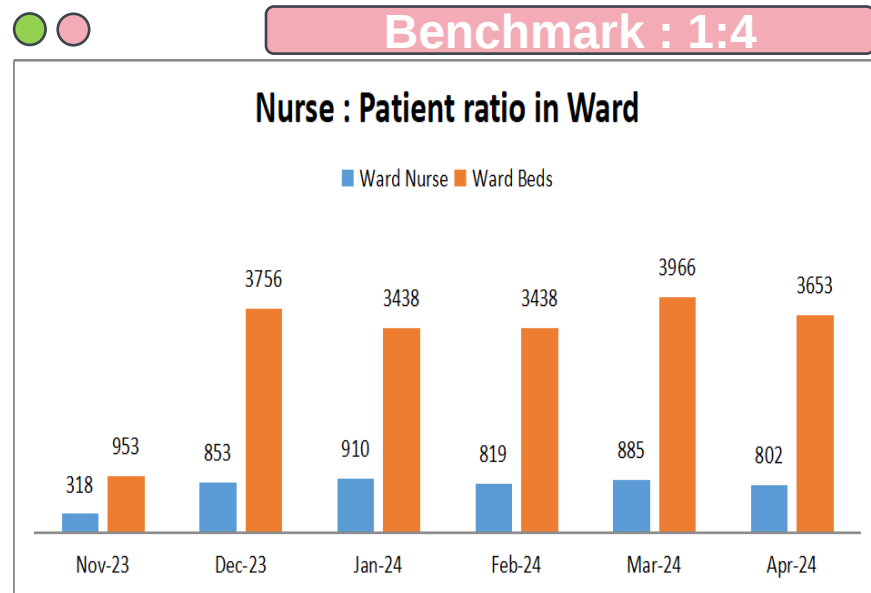
% medication chart with error prone abbreviation



High risk	Implemented	
Medium risk	Incorrectly implemented	
Low risk	Not implemented	



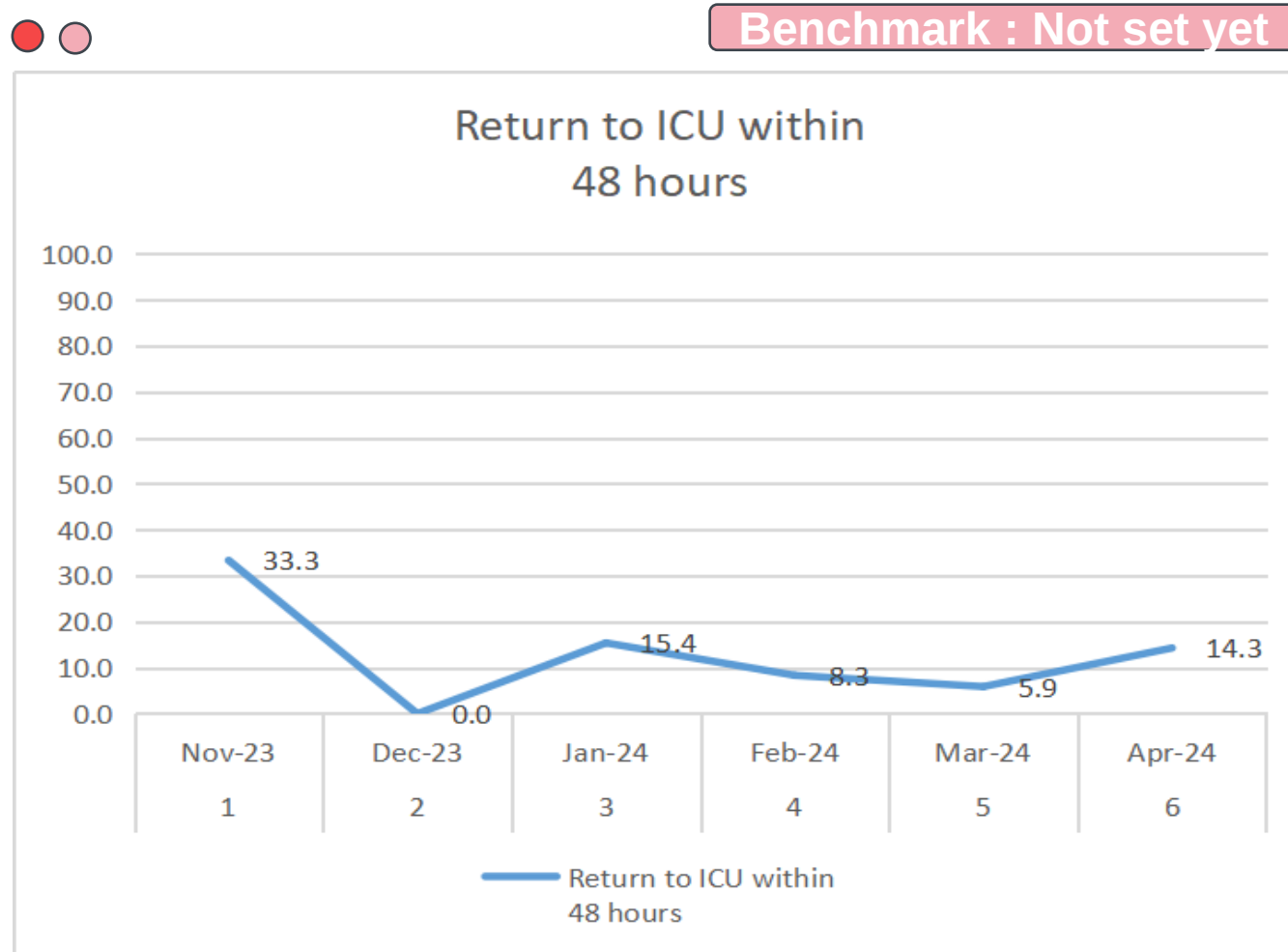
IPD, ICU



ICU

1. Return to ICU within 48 hours
2. Standard mortality ratio for ICU - **NOT IMPLEMENTED**

High risk	Implemented	Implemented
Medium risk	Incorrectly implemented	Incorrectly implemented
Low risk	Not implemented	Not implemented



OT & Pharmacy

OT Indicators -

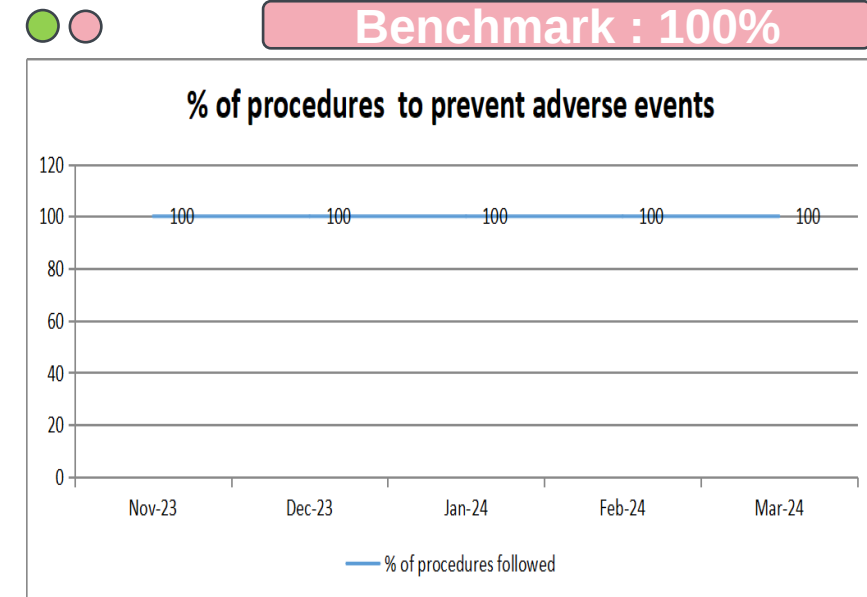
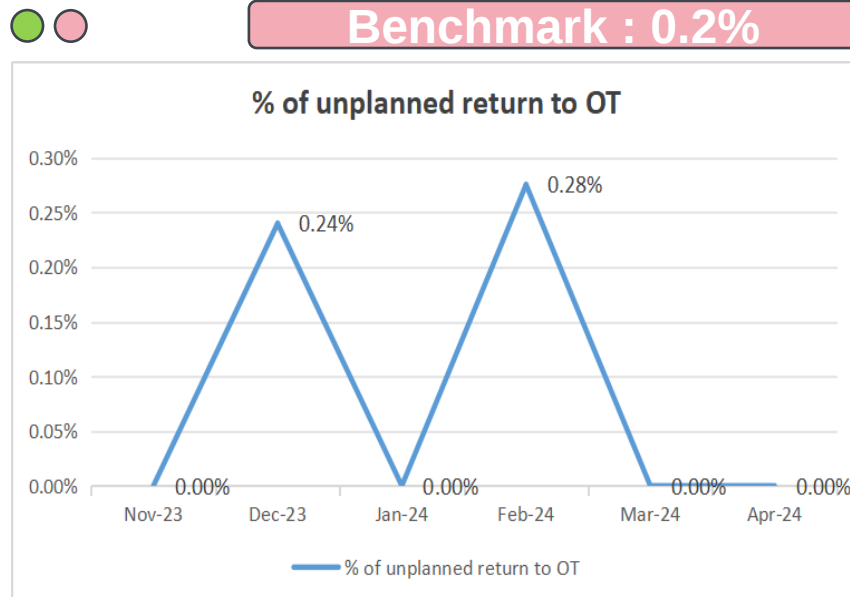
1. Percentage of unplanned return to OT
2. Percentage of surgeries where the organization's procedure to prevent adverse events have been adhered to
3. Percentage of cases who received appropriate prophylactic antibiotics within specified time frame
4. Percentage of rescheduling of surgeries

Pharmacy-

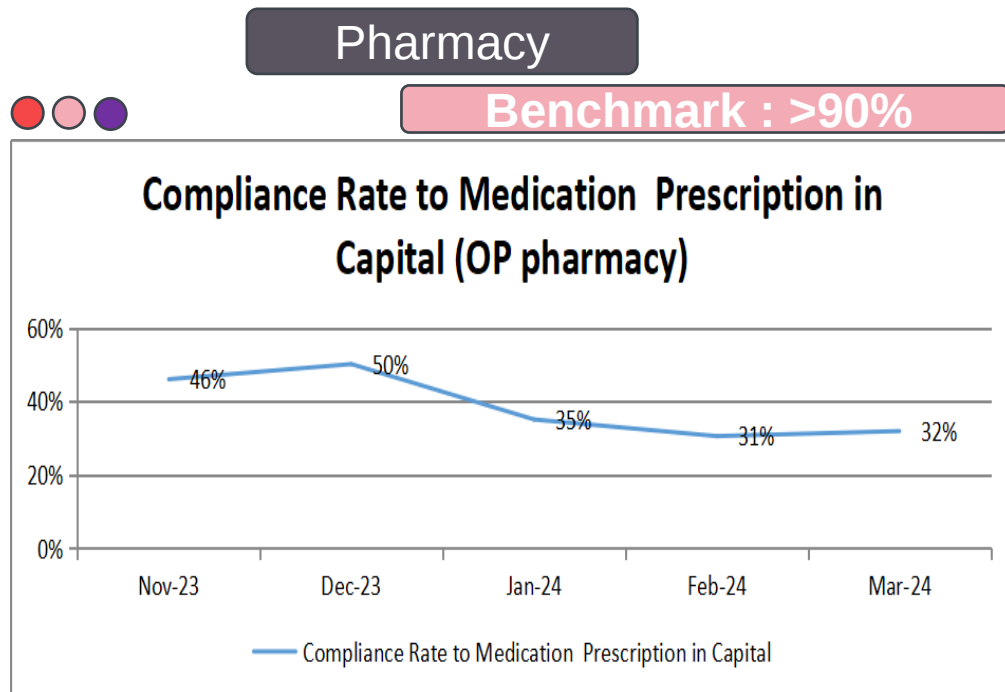
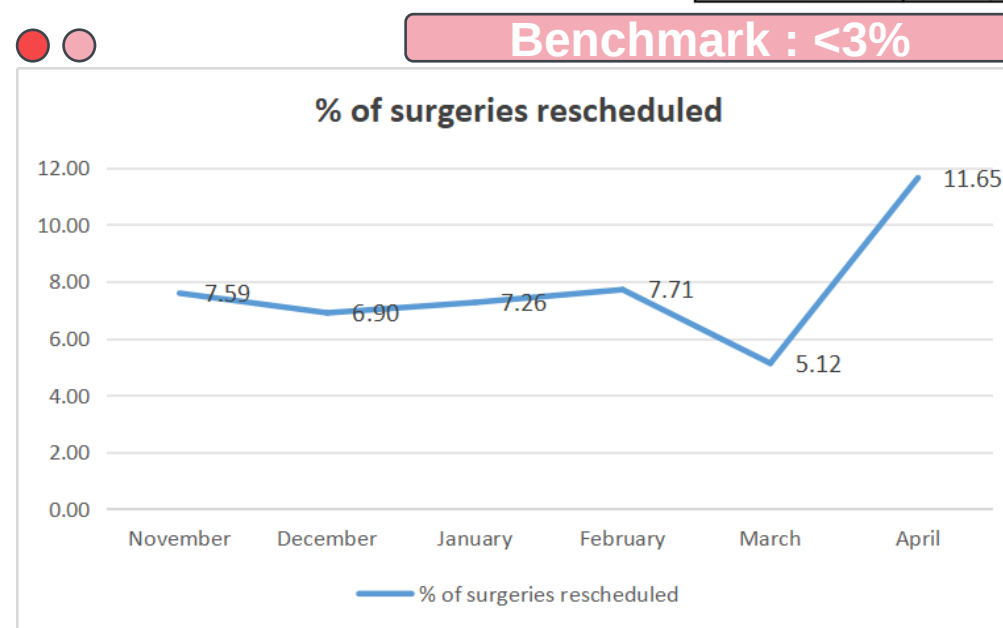
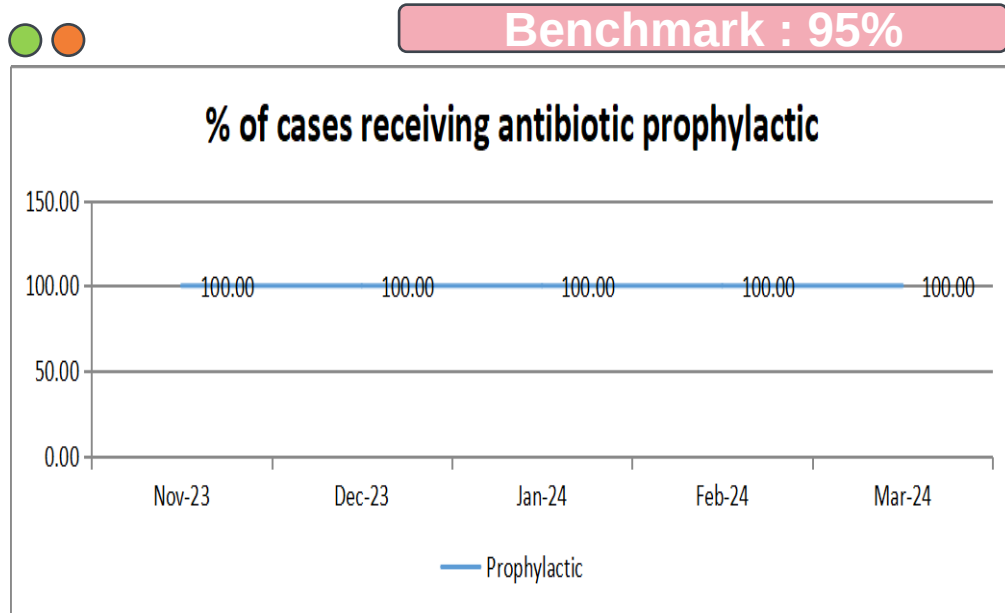
1. Stock out rate of emergency medications – **Implementation from May 2024**
2. Compliance rate to medication prescriptions in capital

High risk	Red circle	Implemented	Pink circle
Medium risk	Yellow circle	Incorrectly implemented	Orange circle
Low risk	Green circle	Not implemented	Purple circle

OT



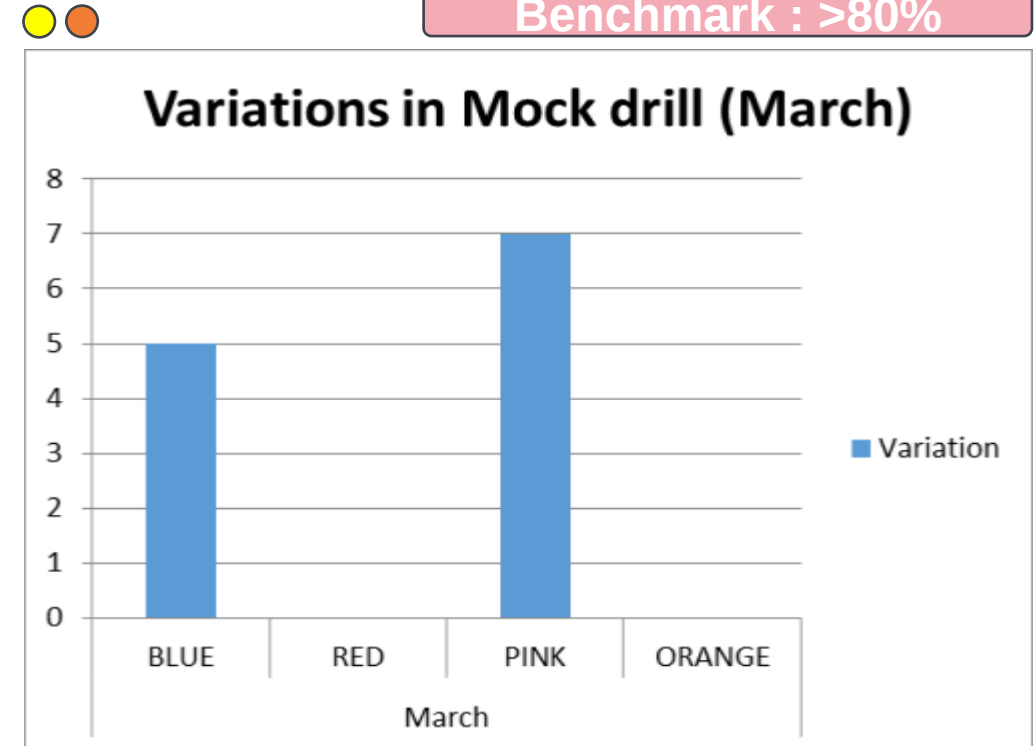
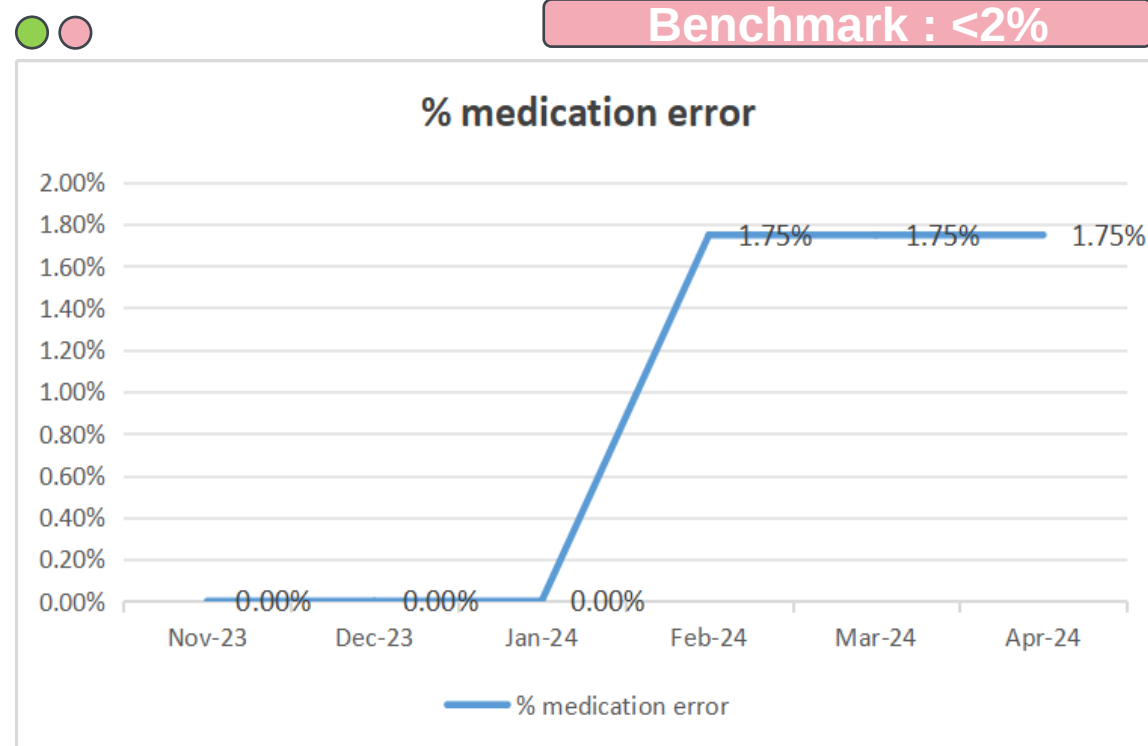
High risk	Implemented	Not implemented
Medium risk	Incorrectly implemented	Not implemented
Low risk	Not implemented	Not implemented



Others

1. Medication error rate
2. No. Of variations observed in mock drills
3. Time taken for discharge
4. Patient Fall rate
5. Percentage of near misses – **NOT IMPLEMENTED**
6. Appropriate handover during shift change (for doctors and nurses) - **NOT IMPLEMENTED FOR DOCTORS**

High risk	Implemented	Not implemented
Medium risk	Incorrectly implemented	Not implemented
Low risk	Not implemented	Not implemented

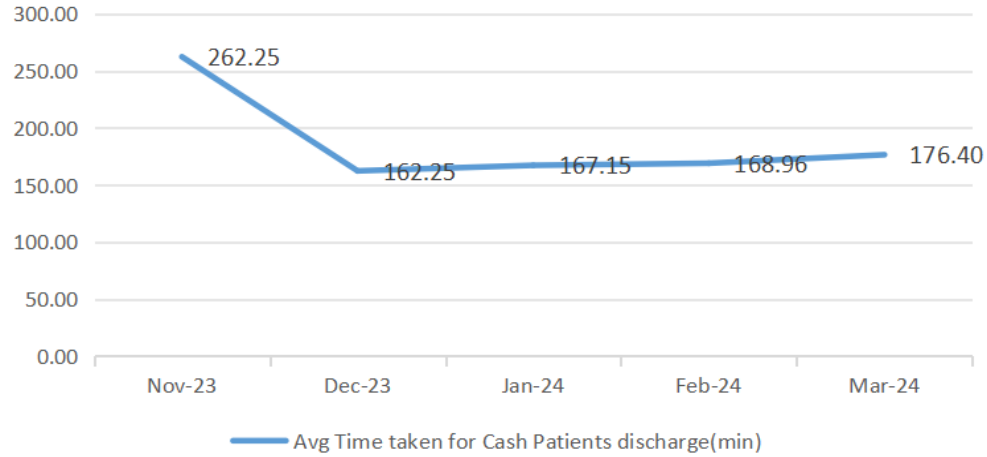


High risk	Implemented	Not implemented
Medium risk	Incorrectly implemented	Not implemented
Low risk	Not implemented	Not implemented



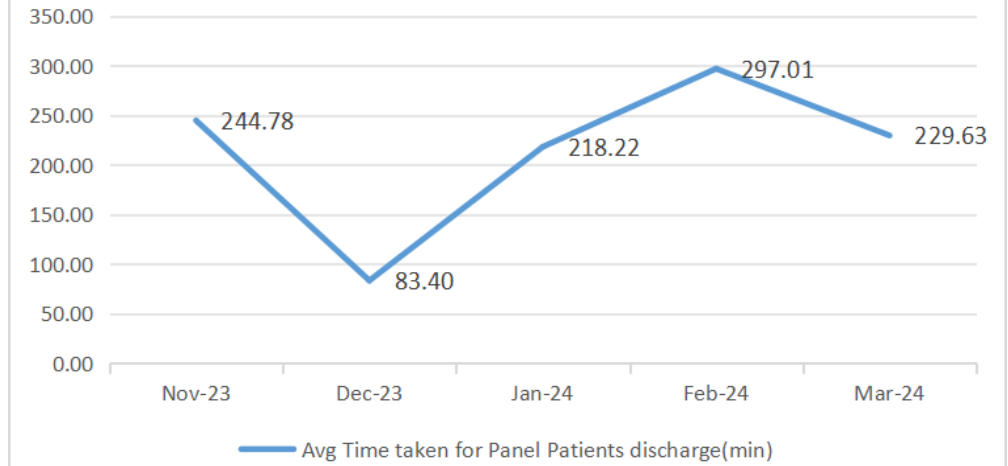
Benchmark : 90-120 min

Avg Time taken for Cash Patients discharge(min)



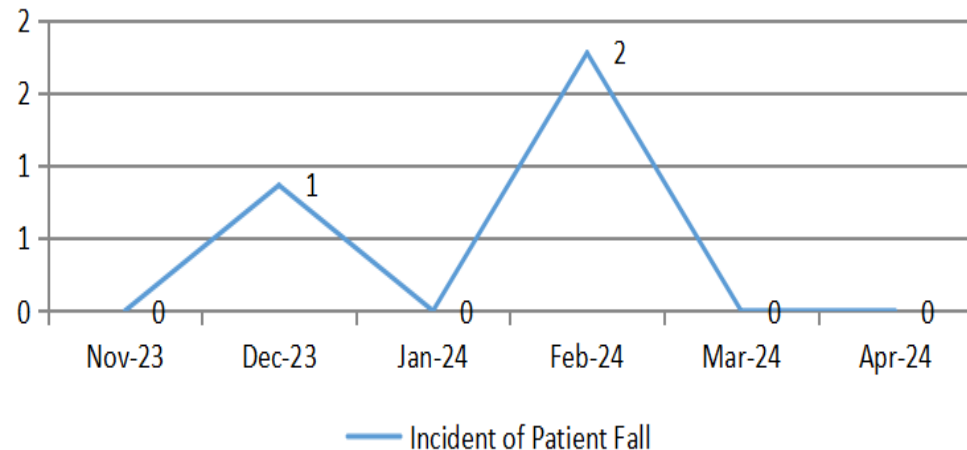
Benchmark : 180-240 min

Avg Time taken for TPA Patients discharge(min)



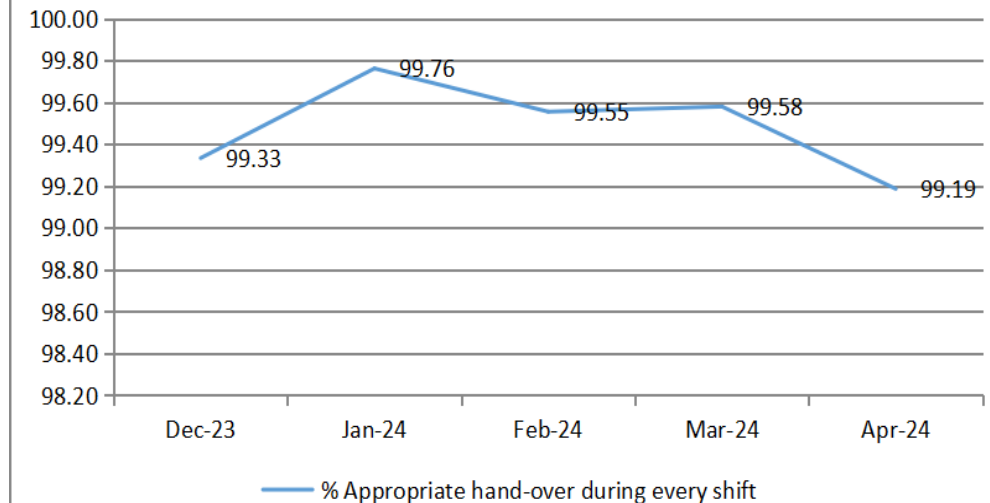
Benchmark : 2/1000

Incident of Patient Fall



Benchmark : >90%

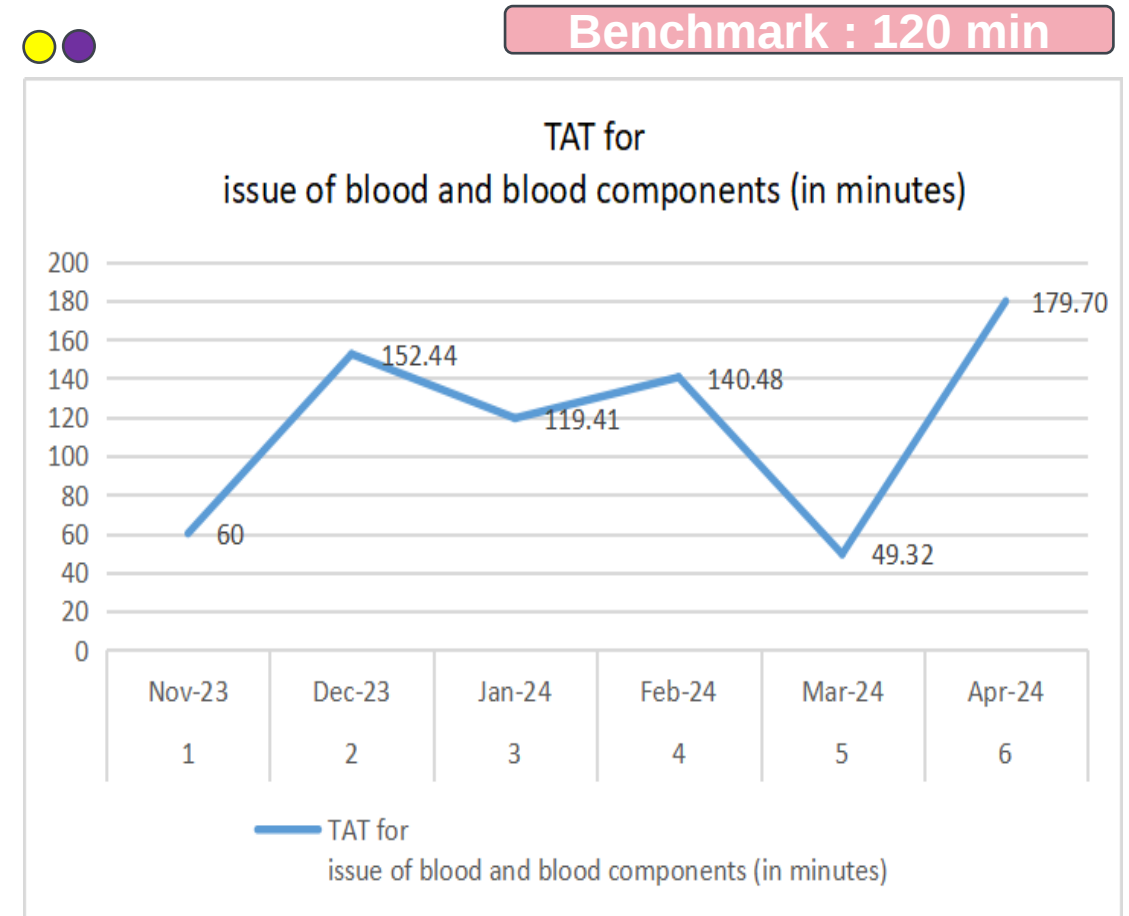
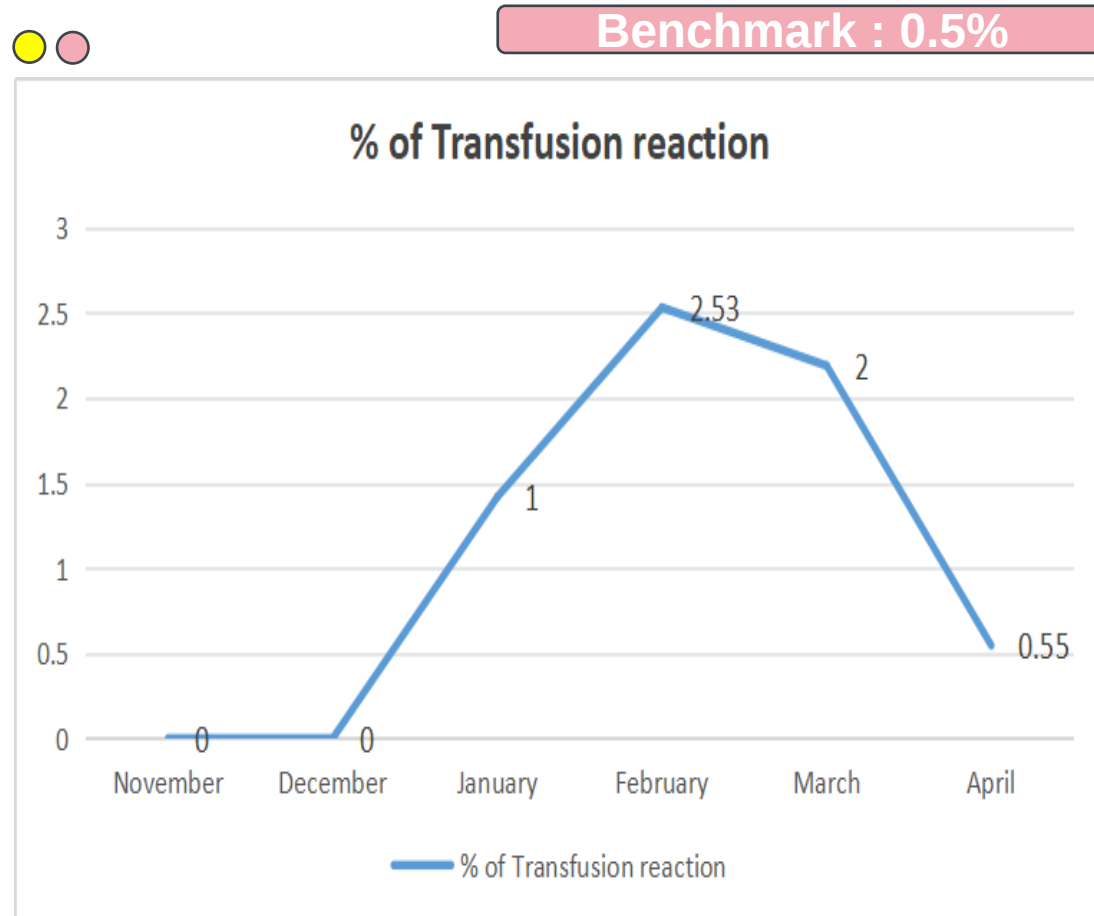
% Nurses Hand-over during every shift



Blood and blood components

1. Percentage of transfusion reaction
2. TAT for issue of blood and blood components

High risk	Implemented
Medium risk	Incorrectly implemented
Low risk	Not implemented



Recommendations & Conclusion

Recommendations

1. **Timeframe for NABH accreditation** to be finalized by Top management keeping following in mind
 - It is suggested to be completed by December 2024 as set by the organisation.
 - Milestone based action plan defining maximum time frame for implementation of each indicator is required
 - Minimum 2 audit cycles of 3 months each to be ensured before NABH is engaged.
 - Responsibility allocation to be done for NABH implementation and monitoring.
2. **Written & documented SOP** to be established for each indicator. SOP for each indicator to include
 - Designated personnel for monitoring and responsibility to be mapped.
 - Timeline for annual/semi-annual revision of SOP to be included therein.
 - Annual/ Semi-annual training of staff regarding NABH Awareness and implementation.
3. **HIS improvement** to be undertaken keeping following in mind-
 - Immediate implementation required in 4 indicators.
 - Issue in HIS reporting of indicator components to be reported by department owner
 - Responsibility mapping of IT personnel to be ensured along
 - Timeline for periodic assessment of HIS output for indicators to be established
4. Specific Recommendations -
 - **Space enhancement** in OPD, OT & Emergency department to be addressed by Top management.
 - **Adequate staff** to be ensured in Emergency, OPD and Pharmacy. Staffing needs in action plan (mentioned in recommendation 1) to be considered.
 - **Implementation of SOFI** scoring in ICU to calculate Standard Mortality Ratio.

Conclusion

- NABH Accreditation seems **favourable** because >50% indicators are already implemented. It is pertinent to note that out of the Implemented indicators, 70% are performing well and display low risk.
- **Immediate action** to be undertaken for implementation of 7 indicators .
- **Attention is required** over 6 indicators which have been improperly implemented and indicate high risk.



A watercolor illustration of a floral arrangement. The composition features several pink and red flowers, some in full bloom and others as buds, arranged in a circular pattern around the central text. The flowers have delicate, layered petals and green stems with small leaves. The background is plain white, making the colors of the flowers stand out. The text 'Thank you' is written in a cursive, pinkish-red font, centered within the floral wreath.

Thank
you